TECHNICAL REPORT FOR THE HASBROUCK GOLD-SILVER PROJECT UPDATED PRELIMINARY FEASIBILITY STUDY, ESMERALDA COUNTY, NEVADA, USA

PREPARED FOR

West Vault Mining Inc.

EFFECTIVE DATE: JANUARY 11, 2023

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NI-43-101 REPORT

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1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

RESPEC has prepared this Technical Report and updated Preliminary Feasibility Study ("PFS") on the Hasbrouck gold-silver project ("Hasbrouck Project", or "Project"), located in the state of Nevada, at the request of West Vault Mining Inc. ("WVM"), a Canadian corporation publicly traded on the TSX Venture Exchange (TSX: WVM) and the US OTC Markets (OTCX:WVMDF). This report supersedes the Technical Report and PFS (Dyer et al., 2016) provided by Mine Development Associates ("MDA"); MDA was acquired by RESPEC in 2019. In January 2014, West Kirkland Mining Inc. ("WKM") entered into an agreement with Allied Nevada Gold Corp. ("Allied" or "Allied Nevada") to acquire up to a 100% interest in Allied's Three Hills, and Hasbrouck properties in Esmeralda County, Nevada. WKM's subsidiary, WK Mining (USA) Ltd. (WK), subsequently completed the acquisition of an initial 75% interest in the Three Hills and Hasbrouck properties from subsidiaries of Allied on April 24, 2014. On September 11, 2014, WK Mining (USA) entered into a mining lease-to-purchase agreement with Eastfield Resources USA Inc. a wholly owned subsidiary of Eastfield Resources Ltd ("Eastfield"), covering 7 patented mining claims that became part of Three Hills Mine. Total consideration to be paid over the life of the lease is CDN$280,000, which has been paid in full. On June 19, 2015, Allied announced that the United States Bankruptcy Court for the District of Delaware had approved the sale of Allied's exploration properties and related assets (excluding the Hycroft operation) to Clover Nevada LLC ("Clover Nevada"), a wholly owned subsidiary of Waterton Precious Metals Fund II Cayman, LP ("Waterton"), which included a 25% interest in the Hasbrouck Mine. The sale did not materially affect the contractual rights of WKM, now WVM, holds the title to the Hasbrouck Mine. WVM's previous name, West Kirkland Mining Inc. (WKM), changed to WVM on July 2, 2020, upon the market open of the TSX: WVM. WVM purchased the remaining 25% interest of the Hasbrouck Mine from Waterton on August 14, 2020. In this report the term WVM is used to refer to West Vault Mining Inc., and both West Kirkland Mining Inc. (WKM), and WK Mining (USA) (WK), interchangeably.

WVM signed a mineral lease agreement with an option to purchase agreement for Hill of Gold, dated November 18, 2016. WVM exercised its option to purchase the claims for Hill of Gold January 2021, by paying US$250,000 to Mr. Robert Bottom. Hill of Gold has now been consolidated within the Hasbrouck property, which now includes the Three Hills Mine, the Hasbrouck Mine, and Hill of Gold.

The purpose of this Technical Report and updated Preliminary Feasibility Study is to provide an updated economic analysis for the Hasbrouck Project, which includes Three Hills Mine and Hasbrouck Mine. This Report also describes the history, drilling, and historical Mineral Resource Estimate of the nearby Hill of Gold. Hill of Gold is not included in the, PFS economic analysis of the Hasbrouck Project. Although capital and operating costs have increased since the 2016 PFS, in this PFS the Project economics have improved primarily due to the increase in metal prices (compared to those in the 2016 PFS), and a slightly increased gold recovery at the end of the mine life. Changes in the current PFS include:

- An increase in diesel price;
- Deferring gold plant at Three Hills Mine by opting for off-site toll processing of carbon;
- Using refurbished crushing and conveying equipment;
- Water sourced from wells instead of the town of Tonopah;
- Reclamation and bond recalculation; and
- Metal price increase.

This report and the estimates provided herein have been prepared in accordance with the Disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions" adopted by the CIM Council on May 10, 2014 and the Guidelines adopted November 29, 2019 ("CIM Standards").

The Hasbrouck Project includes the Three Hills Mine and the Hasbrouck Mine. Shortly after acquiring the properties in April 2014, WVM made the strategic decision to permit each mine separately in order to accelerate permitting the Three Hills Mine under an Environmental Assessment, and to reduce the initial expenditure on permitting to just that necessary for the Project to commence at Three Hills Mine.

WVM started work on permitting Three Hills Mine in June, 2014, with the final permit issued in June, 2016, as summarized in Table 1.1.

Table 1-1. Three Hills Mine – Key Permit Acquisition Schedule
(from WVM, 2023)

Key Permits		
Permit/ Approval	Agency	Issued
Approval of Mine Plan of Operation	US Bureau of Land Management	11/25/2015
New Class I Air Quality Operating Permit to Construct (OPTC)	NV Bureau of Air Pollution Control	6/7/2016
New Class II Air Quality Operating Permit to Construct (AQOP)	NV Bureau of Air Pollution Control	6/7/2016
Mercury Operating Permit to Construct (MOPTC)	NV Bureau of Air Pollution Control	6/7/2016
Reclamation Permit (NRP)	NV Bureau of Mining Regulation and Reclamation	12/3/2015
Water Pollution Control Plan (WPCP)	NV Bureau of Mining Regulation and Reclamation	10/31/2015
Artificial Pond Permit	Nevada Department of Wildlife	To be applied for at construction decision
Dam Safety Permit	Nevada Division of Water Resources	To be applied for at construction decision
Hazardous Material Storage Permit	Nevada State Fire Marshal	To be applied for at construction decision
County Road Maintenance Agreement	Esmeralda and Nye Counties	To be applied for at construction decision

WVM started work on obtaining the federal permit and state reclamation permit to construct, operate, and close the Hasbrouck Mine in November, 2016, with both final permits issued in November 2020. WVM have opted not to acquire state permits for Hasbrouck Mine as a cost-saving measure. State permits are routinely granted on a satisfactory application, typically within a year of application (Table 1-2). Application will be made for other state permits and approvals at the time that construction commences at Three Hills Mine.

Table 1-2. Hasbrouck Mine – Key Permit Acquisition Schedule

Key Permits		
Permit/Approval	Agency	Issued
Decision Record/ Finding of No Significant Impact (DR/FONSI)	US Bureau of Land Management	11/4/2020
Reclamation Permit (NRP)	NV Bureau of Mining Regulation and Reclamation	11/17/2020
New Class I Air Quality Operating Permit to Construct (OPTC)	NV Bureau of Air Pollution Control	To Be Obtained
New Class II Air Quality Operating Permit (AQOP)	NV Bureau of Air Pollution Control	To Be Obtained
Mercury Operating Permit to Construct (MOPTC)	NV Bureau of Air Pollution Control	To Be Obtained
Water Pollution Control Plan (WPCP)	NV Bureau of Mining Regulation and Reclamation	To Be Obtained

WVM began the process for obtaining permits for the Hasbrouck Mine by commissioning Enviroscientists Inc. to perform base-line botany studies in 2014 and 2015. A class III cultural survey was performed by Western Cultural Resource Management in 2011 with no findings that would have a negative impact on the Project.

There are no known environmental issues at either property that would be expected to have a material impact on WVM's ability to extract the Mineral Resources.

1.2 ACCESS, PROPERTY DESCRIPTION AND LAND

The Hasbrouck property includes three separate deposits, the Three Hills gold mine, the Hasbrouck gold-silver mine, and Hill of Gold, all located in the northern portion of Esmeralda County, Nevada. The Three Hills Mine is located approximately one mile west of the town of Tonopah and is accessed via county-maintained roads from the northwest end of Tonopah and from US Highway 95 approximately three miles south of Tonopah. U.S. Highway 6 passes 1.25 miles north of the Three Hills Mine and is a major east-west transportation corridor through central Nevada. Hill of Gold is located approximately four miles southwest of the town of Tonopah. The Hasbrouck Mine is located approximately five miles by road south of the town of Tonopah and is accessed directly off U.S. Highway 95. U.S. Highway 95 is the main north–south transportation corridor through central Nevada and passes immediately to the west of the Hasbrouck Mine.

Elevations of the properties vary between 5,600ft and 6,300ft. The principal physiographic features of both the Three Hills and Hasbrouck mines are prominent hills that rise 200ft - 700ft off the valley floor. Vegetation in the area consists of sagebrush and other desert plants on the lower slopes and valleys. Trees are absent from the properties (including yucca brevifolia). The climate is semi-arid. Average annual precipitation is five inches, which accumulates through winter snows, and, to a lesser extent, summer thunderstorms.

Three Hills Mine is covered by 14 patented claims and 100 unpatented lode claims occupying a total of approximately 1,972 acres in Sections 2, 3, 4, 5, 8, 9, 10 and 11, T2N, R42E, and Sections 33 and 34, T3N, R42E of the Mount Diablo Base and Meridian. Hasbrouck Mine is covered by 28 patented mining claims and 532 unpatented mining claims occupying an area of approximately 9,390 total acres within Sections 1, 2, 3, 4, 5, 9, 10, 11, 12,13,14, 15,16, 23, 24, and 26 T1N, R42E, Sections 6, 7, 18, 19 and 20, T1N, R43E, and Sections 16, 17, 20, 21, 22, 23, 27, 28, 29, 32, 33, 34, and 35, T2N, R42E of the Mount Diablo

Base and Meridian. Hill of Gold is covered by 25 unpatented lode claims occupying a total of approximately 442 acres in sections 15, 16, 21, and 22 of T2N, R42E of the Mount Diablo Base and Meridian, located approximately at the south end of the San Antonio mountains approximately two miles southwest of Siebert Mountain.

All unpatented claims are located on U.S. federal land managed by the Battle Mountain District of the U.S. Bureau of Land Management ("BLM"). The unpatented claims are registered and recorded with the BLM, Esmeralda and Nye Counties as appropriate, but have not been surveyed by a mineral land surveyor. Mineral tenure is held variously in the names of WK Mining (USA) Ltd., WK-Allied Hasbrouck LLC, and West Kirkland Mining Inc., all of which are wholly owned subsidiaries of WVM. All required payments have been made to the appropriate authorities and the claims are in good standing.

For Three Hills Mine, all claims are subject to a mineral production royalty of 1.25% (Triple Flag Metals Corp.) and a precious metal stream of effectively 1.13% (Sprott Private Resources Streaming and Royalty (B) Corp).

At Hasbrouck Mine, all 532 unpatented and 28 patented claims are subject to a 1.25% NSR Royalty (Triple Flag Metals Corp.) and a precious metal stream of effectively 1.13% (Sprott Private Resources Streaming and Royalty (B) Corp), while an additional further 1.5% NSR royalty is applicable to 17 of the patented claims and two of the unpatented claims (RG Royalties Inc.).

1.3 HISTORY

Modern exploration at Three Hills began in 1974 when Cordex Exploration obtained the property. During the 1970's, 1980's and 1990's, Cordex, Saga Exploration, Echo Bay, Gexa Gold, Coeur D'Alene Mines, Eastfield., and Euro-Nevada carried out various campaigns of surface mapping, sampling, geophysical surveys and drilling. Newmont acquired control of Three Hills via their merger with Euro-Nevada and subsequently sold the property to Vista Gold in 2003. Vista did not conduct exploration at Three Hills; the property was part of the spin-off to Allied Nevada in 2007. Allied Nevada initiated exploration at Three Hills in 2012. Drilling in 2012 and 2013 was focused on expanding known mineralization. During 2014, WVM performed geologic mapping, sampling, a gravity survey, drilling and detailed structural analysis at Three Hills.

Silver and gold mineralization was first discovered on Hasbrouck Mountain in 1902. Early mining exploited the Kernick vein, which was worked on a small scale through the mid-1920s. The early miners completed about 6,500ft of adits and 1,000ft of raises and recorded production of 740 tons of ore that grossed $10,406. A large, near-surface, low-grade gold-silver deposit was outlined by Cordex Exploration following surface and underground sampling, geologic mapping, rotary drilling and metallurgical testing conducted in 1974-1975 and 1980. During the 1980s and 1990s, Franco-Nevada, FMC, Euro-Nevada, and Corona successively drilled the property before Newmont merged with Euro-Nevada in 2002 and took control of the property. Newmont vended the property to Vista Gold in 2003. Allied Nevada gained control of Hasbrouck when it was formed as a spin-off company from Vista in 2007. Allied Nevada conducted surface mapping, geochemical sampling, drilling, Data Verification, metallurgical studies, CSAMT and gravity surveys, and completed a Preliminary Economic Assessment. In 2014, WVM carried out geologic mapping, surface sampling, drilling and structural geologic interpretation. WVM also conducted a re-interpretation of geophysical data obtained by previous operators.

Cordex Exploration conducted surface and underground sampling, geologic mapping, and drilling between 1974 – 1985. During the 1980s and 1990s, Crown Resources, Phelps Dodge, and Eastfield. successively drilled the property. Eastfield. and Prism Resources Inc. ("Eastfield-Prism") requested Mine Development Associates ("MDA") to perform a Mineral Resource estimate and a pre-feasibility-level economic analysis of Hill of Gold in 1996. WVM carried out RC drilling in 2017 – 2018 and took control of the property in 2021.

1.4 GEOLOGY AND MINERALIZATION

Three Hills Mine, located in the Tonopah Mining District, is a low-sulfidation, epithermal gold deposit, and occurs in a zone of pervasive silicification within the outcropping Siebert Formation immediately above and along the contact with the underlying Fraction Tuff. Mineralization occurs in discontinuous, irregular 0.05in to 0.5in wide veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz. Oxidation has destroyed sulfide minerals within the deposit. The currently drill-defined extent of mineralization is approximately 1,000ft east–west by 2,700ft north–south with a maximum depth of 500ft. Mineralization remains open at depth, down-dip to the east along the Siebert/Fraction Tuff contact.

Hasbrouck Mine is a low-sulfidation, epithermal gold–silver deposit located in the western portion of the Divide Mining District. Host rocks are primarily tuffs and sediments of the Siebert Formation with limited mineralization within the underlying Fraction Tuff. An erosional remnant of silica sinter, deposited during hot spring activity, has been mapped near the top of the mountain. Gold and silver mineralization consists principally of 0.1in to 1.0in wide, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with larger, but erratic bodies of hydrothermal breccia. Sulfide minerals have been largely oxidized. Mineralization is accompanied by strong pervasive silicification, with associated adularia and pyrite, and has a known extent of 2,800ft east–west by 2,400ft north–south, with a maximum depth of 900ft. Mineralization is open at depth and to a limited extent to the northwest and east.

Hill of Gold, located in the Tonopah Mining district, is a low-sulfidation, epithermal gold deposit, and occurs in two settings, the first within a northeast trending structural zone along long narrow "lenses", and second is at or near the Oddie-Siebert and Oddie-Fraction contact.

1.5 DRILLING

The current database for Three Hills includes 291 drill holes with a total of 88,199ft of historical drilling performed from 1974 through 2013. During 2014, WVM drilled three diamond-core holes and 11 reverse-circulation ("RC") holes. The diamond-core holes were drilled within the Three Hills gold-silver Mine to obtain samples for geotechnical studies. The 2014 RC holes were drilled mainly to expand the eastern and down-dip portions of the Three Hills Mineral Resource. It is RESPEC's opinion that the 2014 RC holes do not materially affect the current Mineral Resource Estimate due to their locations and therefore have not been included in the current Mineral Resource database. The drilling does show that the deposit is open to the east, and more drilling may add more mineral resources in this area.

The current database for Hasbrouck Mine contains 322 drill holes with a total of 219,619ft of historical drilling completed by five companies from 1974 through 2012. This includes 28,606ft of diamond-core drilling in 43 holes, and 189,803ft of RC and conventional rotary drilling in 277 holes. During 2014, WVM completed 4,320ft of RC drilling in 14 drill holes at the Hasbrouck Mine. In 2018, WVM drilled one (500ft) RC hole at the Hasbrouck Mine. It is RESPEC's opinion that the 2014 and 2018 RC holes are external to the estimated Mineral Resources, and do not materially affect the current Mineral Resource Estimate due to their locations, and therefore have not been included in the current Mineral Resource database.

The database for Hill of Gold includes 89 drill holes with a total of 29,926ft of historical drilling performed from 1974 through 1996. There are a total of 5,592 samples with a gold assay, most being 5ft in length, the average length being 5.1ft. WVM drilled one RC hole in 2017 and two RC holes in 2018. The RC holes were drilled mainly to expand the 1996 historical Mineral Resource area to the north and west. It is RESPEC's opinion that the 2017-2018 RC holes do not materially affect the current Mineral Resource Estimate due to their locations and therefore have not been included in the current Mineral Resource database.

1.6 SAMPLE PREPARATION, ANALYSES AND SECURITY

RESPEC has evaluated the available information for historical sample preparation methods, analytical procedures and sample security. RESPEC concludes that the sampling, assaying, and security procedures used at Three Hills and Hasbrouck have followed industry standard procedures, and are adequate for the estimation of the current Mineral Resources.

1.7 DATA VERIFICATION

RESPEC completed a full audit of the Allied 2010-2013 drill data at Three Hills and Hasbrouck for the current Mineral Resource Estimate. Quality control/quality assurance ("QA/QC") data are not available for drilling conducted before 2010. RESPEC has reviewed the available QA/QC data and the assessments of that data made by Wilson (2014) and references therein, including Prenn (2003) and Prenn and Gustin (2003, 2006). RESPEC considers the assay data to be adequate for the estimation of the current Mineral Resources.

1.8 METALLURGICAL TESTING

Column-leach and bottle-roll cyanide extraction tests indicate that mineralization comprising the Three Hills and Hasbrouck gold-silver mines is amenable to cyanide heap leaching.

At Three Hills, gold recovery by fraction indicated that the gold is not locked in a silica matrix, but rather that the gold is on the surface of coarser particles. This indicates that the rock is breaking on fracture lines, which would expose the gold to leach solutions and allow recovery in a run-of-mine (ROM) heap leach. Test columns indicated that there was a logarithmic gold head grade to recovery relationship that varied from 70% gold recovery at a head grade of 0.010 opt to 95% recovery at head grade of 0.040 opt. Reagent consumptions were predicted to be 0.45lb NaCN per ton of ore and lime to be 4.0lb per ton of ore. The leach cycle time was predicted to be 171 days.

At Three Hills silver contents are low and recovery of silver has not been estimated but is expected to be negligible.

Testing of material from Hasbrouck Mine has shown that gold recoveries increase with decreasing particle size and also vary with the stratigraphic hosts to the mineralization. There were two stratigraphic host units identified, which were recognized as the Upper Siebert and the Lower Siebert. Each unit had a unique gold and silver recovery, which was shown to be related to the elevation in the deposit relative to the surface. The test program results also indicated that primary crushing and secondary crushing, followed by high-pressure grinding roll ("HPGR") crushing increased the gold and silver recovery for both units. In the column tests, HPGR crushed material was agglomerated with cement to ensure leach solution percolation.

The Upper Seibert unit at Hasbrouck Mine had a gold recovery that varied from 40% to 60%, which includes a 10% enhancement due to HPGR crushing. Silver recovery for the Upper Seibert unit was estimated at an average of 24%.

The Lower Seibert unit at Hasbrouck Mine had a gold recovery that varied from 70% to 80%, which includes a 5% enhancement due to HPGR crushing. Silver recovery for the Upper Seibert unit was estimated at an average of 17%.

Cyanide consumption was estimated at 0.75lb/ton and cement consumption was estimated at 4.0lb/ton for both the Upper and Lower Siebert units.

Heap leach cycle time was estimated at 115 days for both the Upper and Lower Siebert units.

1.9 MINERAL RESOURCE ESTIMATE

The modeling and estimation of the Mineral Resources at the Hasbrouck Project were completed under the supervision of Jeff Bickel, Qualified Person with respect to Mineral Resource estimations under NI 43-101.

To complete the resource estimation for Three Hills Mine, the drill data were evaluated statistically, geology and gold mineral domains were interpreted on east-west oriented cross sections spaced at 100-foot intervals that span the extents of the presently defined deposit, and the gold mineral domains were refined on north-south oriented long sections spaced at 20-foot intervals. The final modeled gold mineral domains were then coded into a 20ft x 20ft x 20ft block model and used to constrain the gold grade estimation. Grade estimation was by Inverse Distance Cubed ("ID3"). The Effective Date of the Three Hills Mineral Resource Estimate is December 15, 2022.

The Three Hills Mine Mineral Resources, at the reported 0.005oz Au/ton cut-off grade, are inclusive of estimated Mineral Reserves and are summarized in Table 1-3 (Effective Date: December 15, 2022).

Table 1-3. Three Hills Reported Mineral Resources (0.005oz Au/ton Cut-off)

Three Hills Mineral Resources			
Indicated			
Material	K Tons	oz Au/ton	K oz Au
Total	10,423	0.018	185
Inferred			
Material	K Tons	oz Au/ton	K oz Au
Total	1,008	0.017	17

Note: rounding may cause apparent inconsistencies

1. Mineral Resources for Three Hills Mine are estimated using a 0.005oz Au/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1850 per ounce, a mining cost of $2.39/ton mined, a processing cost of $2.98/ton processed, a grade-dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.42/ton processed, and a 2.38% NSR Royalty.
2. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
3. Mineral Resources are reported inclusive of Mineral Reserves.
4. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to measured or indicated mineral resource with continued exploration.
5. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
6. The Effective Date of the Mineral Resource estimations is December 15, 2022.
7. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

To complete the Mineral Resource Estimate for Hasbrouck Mine, the drill data were evaluated statistically, geology and gold and silver mineral domains were interpreted on cross sections spaced at 50- and 100-foot intervals that span the extents of the presently defined deposit, and the mineral domains were refined on level plans spaced at 10-foot intervals. The final modeled mineral domains were then coded into a 20ft x 20ft x 20ft block model and used to constrain the gold and silver grade estimations. Grade estimation was by Inverse Distance Squared ("ID2"). The Effective Date of the Hasbrouck Mine Mineral Resource Estimate is December 15, 2022.

Hasbrouck Mine gold and silver Mineral Resources, at the reported 0.007oz AuEq/ton cut-off grade, are inclusive of estimated Mineral Reserves and are summarized in Table 1-4 (Effective Date: December 15, 2022). The gold-equivalent ("AuEq") grade is calculated using the individual gold and silver grades of each block, along with a gold price of $1,850 per ounce gold and a silver price of $22.75 per ounce silver. The AuEq grade calculation includes an approximate 4:1 difference in gold versus silver recovery in the proposed heap-leach processing scenario.

Table 1-4. Hasbrouck Mine Reported Mineral Resources (0.007oz AuEq/ton Cut-off)
Upper Siebert: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0053)
Lower Siebert: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0027)

Hasbrouck Mineral Resources					
Measured					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	6,987	0.019	0.39	134	2,752
Indicated					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	35,041	0.015	0.27	516	9,404
M&I					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	42,028	0.015	0.29	651	12,156
Inferred					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	5,161	0.011	0.19	56	986

Note: rounding may cause apparent inconsistencies

1. Mineral Resources for Hasbrouck Mine are estimated using a gold equivalent 0.007oz AuEq/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1,850 per ounce and silver price of $22.75 per ounce , a mining cost of $2.39/ton mined, a processing cost of $4.81/ton processed, a lithologic- and depth dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.36/ton processed, and a 2.38% NSR Royalty.
2. The Hasbrouck gold equivalent cutoff grade is using the following formulas:
   - Oz AuEq/ton = oz Au/ton + (oz Ag/ton x AuEq Factor)
   - AuEq Factor = (Au Price / Ag Price) x (Au Recovery / Ag Recovery)
   - Upper Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0053)
   - Lower Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0027)
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Mineral Resources are reported inclusive of Mineral Reserves.
5. These Mineral Resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to measured or indicated mineral resource with continued exploration.

6. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
7. The Effective Date of the Mineral Resource estimations is December 15, 2022.
8. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

1.10 HISTORICAL ESTIMATES

Historical Estimates for Hill of Gold, performed by Eastfield in 1996, are presented in Table 1-5. RESPEC believes that these Historical Estimates were not prepared in full compliance with the provisions of National Instrument 43-101. They are included for historical completeness. There was no adjustment of the 1996 Historical Estimate to account for the tonnage mined in the historical early operations described in section 6.3.

Table 1-5. Hill of Gold 1996 Historical Estimates
(from MDA, 1996)

Company	Method	Year	Cut-off oz Au/ton	K Tons	Grade oz Au/ton	K oz Au
Eastfield/Prism(MDA)	OK	1996	0.01	1629.0	0.026	42.35

This Historical Estimate for Hill of Gold was prepared in 1996 (the "Historical Estimate") for Eastfield and reported in Hardy and Ristorcelli (1996), Hill of Gold Project, Resource Evaluation: unpublished report. The key assumptions, parameters, and methods (to the extent known to RESPEC) are provided in section 6.2.3. A Qualified Person has not done sufficient work to classify the Historical Estimate as current Mineral Resources or Mineral Reserves under National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and WVM is not treating the Historical Estimate as current Mineral Resources or Mineral Reserves. There can be no certainty, following further evaluation and/or exploration work, that the Historical Estimate can be upgraded or verified as Mineral Resources or Mineral Reserves in accordance with NI 43-101.

Hill of Gold does not have any current Mineral Resource or Mineral Reserve Estimates. The Hasbrouck Project includes current Mineral Resource and Mineral Reserve Estimates for Three Hills Mine and Hasbrouck Mine. Historical Estimates for Three Hills Mine and Hasbrouck Mine are provided in section 6.2

1.11 MINERAL RESERVES ESTIMATE

RESPEC has used Measured and Indicated Mineral Resources as the basis to define Mineral Reserves for both the Three Hills and Hasbrouck mines, which together comprise the Hasbrouck Project. Open-pit mining was selected as the mining method. Mineral reserve definition was done by identifying ultimate pit limits using economic parameters and pit optimization techniques. The economic parameters used for pit optimization are presented in Table 1-6.

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Table 1-6. Pre-Feasibility Economic Parameters

			Hasbrouck	
		Three Hills	Upper Siebert	Lower Siebert
Mining	$/ton Mined	$ 2.39	$ 2.39	$ 2.39
Leaching	$/ton Processed	$ 2.33	$ 4.81	$ 4.81
G&A Cost per Year	$/yr	$ 2,262,000	$ 2,262,000	$ 2,262,000
Tons per Day	ton/day	15,000	17,000	17,000
Days per Year	days/yr	360	360	360
Tons per Year	ton/yr	5,400,000	6,120,000	6,120,000
G&A Cost per Ton	$/ton Processed	$ 0.42	$ 0.37	$ 0.37
Recovery - Au		Eq 1	Eq 2	Eq 3
Recovery - Ag			24%	17%
Royalty	NSR	2.38%	* 3.88%	* 3.88%

1. * All of Hasbrouck is Subject to a 2.38% NSR royalty and portions of Hasbrouck are subject to a 1.5% Royal Gold royalty
2. Eq1 Recgold= min(0.925, (0.1786 *ln (grade in opt) + 1.5203) - 0.025)
3. Eq2 Recgold= (0.0009 * (Depth below topo in feet)) + 0.3026 + 0.10
4. Eq3 Recgold= (0.0002 * (Depth below topo in feet)) + 0.6412 + 0.05
5. CIM definitions were followed for Mineral Reserves.
6. Inferred Mineral Resource do not contribute to the financial performance of the Project and is treated in the same way as waste.
7. There is no known *mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the estimate.*

Crushing and stacking costs do not apply to Three Hills because Three Hills ore will be processed using ROM leaching.

Silver was not used to generate value in Three Hills because there are no stated silver Mineral Resources for that deposit. For Hasbrouck Mine, the value from silver was calculated with constant silver to gold ratio based on $1,750/oz Au to $21.00/oz Ag prices to develop Mineral Reserves. Note that the final cash-flow evaluation used $1,790/oz Au and $22.50/oz Au metal prices. Gold and silver recoveries were applied based on estimates provided by Mark Jorgensen of JE&TS.

The pit designs from the 2016 PFS have not been modified, but RESPEC has confirmed that they remain reasonable for the purposes of this study. The 2016 ultimate pit limits were determined using prices of $1,250 and $18.00 per ounce of gold and silver respectively. The ultimate pit was selected on Whittle discounted evaluations using a 5% discount rate and a processing limit of 5,400,000 tons per year. The gold price used for the Hasbrouck Project cash-flow calculation in the 2016 PFS was $1,275 per ounce gold and $18.21 per ounce silver. The costs since the 2016 report have increased but have been offset by higher gold prices. RESPEC believes that the pit designs resulting from the initial analysis are well within reason.

Pit designs were created using 20-foot bench heights for mining. This corresponds to the Mineral Resource model block heights. Because the Mineral Resource models have been diluted to the block grades, RESPEC considers the block size to be reasonable with respect to dilution and equipment anticipated to be used in mining and believes that this represents an appropriate amount of dilution for statement of Mineral Reserves.

Proven and Probable Mineral Reserves for the Three Hills and Hasbrouck mines are shown in Table 1-7 and Table 1-8, respectively. Total Proven and Probable Mineral Reserves for the entire Hasbrouck Project are shown in Table 1-9.

Table 1-7. Three Hills In-Pit Probable Mineral Reserves

Three Hills	K Tons	oz Au/ton	K Ozs Au
Probable	9,653	0.018	175

1. Mineral Reserves are estimated based on previously designed pits which have been validated using $1,750/oz gold and $21.50/oz silver (note the project cash-flow analysis uses 3-year rolling average prices of $1,790/oz gold and $22.50/oz Silver).
2. Three Hills Mineral Reserves are defined with a 0.005 oz Au/ton and a grade-dependent recovery equation for gold provided by Mr. Mark Jorgenson.
3. The Mineral Reserves were created using CIM definitions.
4. Inferred Mineral Resources do not contribute to Mineral Reserves and were treated the same way as waste.
5. No mining, metallurgical, infrastructure, or permitting factors that could materially affect the estimate are known to RESPEC.
6. Mineral Resources are inclusive of Mineral Reserves.

Table 1-8. Hasbrouck In-Pit Proven and Probable Mineral Reserves

Hasbrouck Upper Siebert	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	1,189	0.021	25	0.420	499
Probable	4,441	0.018	80	0.313	1,391
Proven & Probable	5,630	0.019	105	0.336	1,890
Hasbrouck Lower Siebert					
Proven	4,942	0.021	101	0.417	2,058
Probable	23,798	0.016	372	0.275	6,555
Proven & Probable	28,740	0.016	473	0.300	8,614
Total Hasbrouck					
Proven	6,130	0.021	126	0.417	2,558
Probable	28,239	0.016	452	0.281	7,946
Proven & Probable	34,370	0.017	578	0.306	10,504

1. Mineral Reserves are estimated based on previously designed pits which have been validated using $1,750/oz gold and $21.50/oz silver (note the project cash-flow analysis uses 3-year rolling average prices of $1,790/oz gold and $22.50/oz Silver).
2. Hasbrouck Mine Mineral Reserves use a variable gold recovery based on material in Upper Siebert and Lower Siebert lithologies along with depth below topography.
3. Hasbrouck Mine Mineral Reserves use a constant silver recovery of 24% and 17% in the Upper Siebert and Lower Siebert lithologies, respectively.
4. A minimum grade of 0.007 is used for both gold and silver.
5. Hasbrouck Mine Mineral Reserves use a gross metal value (GMV") cutoff of $5.17/T which includes the cost for processing and G&A
6. The Mineral Reserves were created using CIM definitions.
7. Inferred Mineral Resources do not contribute to Mineral Reserves and were treated the same way as waste.
8. No mining, metallurgical, infrastructure, or permitting factors that could materially affect the estimate are known to RESPEC.
9. Mineral Resources are inclusive of Mineral Reserves.

Table 1-9. Total Hasbrouck Project In-Pit Proven and Probable Mineral Reserves

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	6,130	0.021	126	0.417	2,558
Probable	37,893	0.017	627	0.210	7,946
Proven & Probable	44,023	0.017	753	0.239	10,504

Some summation discrepancies may be noticeable to minor rounding issues.

These Mineral Reserves are shown to be economically viable based on the Hasbrouck Project cash flows and RESPEC believes that they are reasonable for the statement of the Proven and Probable Mineral Reserves for the Hasbrouck Project.

1.12 MINING METHODS

The Hasbrouck Project PFS includes mining at both the Three Hills Mine and the Hasbrouck Mine. These are planned as open-pit, truck and loader operations. Access roads were included in the pit and waste rock storage area designs, which were considered suitable for the type of equipment used. Waste rock storage areas were designed to contain the waste rock associated with the Mineral Reserves. One main waste rock storage area was identified for Three Hills and two additional waste rock storage areas were designed for Hasbrouck. Safety berms were designed between the designed pits and dumps and US Highway 50 to contain any material that may roll off the mining site.

The PFS has been based on contract mining. Only the Proven and Probable Mineral Reserves were used to schedule process production, and Inferred Mineral Resources inside of the pit were considered waste.

Three Hills production schedules have been completed based on a 15,000tpd production requirement for the ROM heap-leach pad. Detailed monthly schedules were created for the construction period based on construction requirements for heap-leach over-liner and fill material requirements defined by NewFields. In total, 504,000 cubic yards (702,000 tons) of waste rock is scheduled for construction purposes. No pre-stripping is required at the Three Hill Mine.

Ore placed on the pad at Three Hills Mine had a lag time applied so that gold production was not assumed at time of placement. The schedule assumed that the operational recovery of 79% would take up to 8 months. Drain-down recovery of 2.5% was assumed during the 12 months after final operational recovery was achieved.

Hasbrouck Mine production schedules were completed based on a 17,500tpd production requirement. Mining at Hasbrouck was assumed to start during the second year of production for the Project. Little pre-stripping is required as ore is located near the surface, though waste rock is mined early to provide construction fill material.

A lag time in gold recovery was applied to ore placed on the heap-leach pad. The schedule assumed that the full recovery of recoverable gold placed on the pad would take up to 8 months. Upper Siebert ore was assigned a 55.6% operational gold recovery and Lower Siebert was assigned a 76.1% operational gold recovery. Upper Siebert ore was assigned a 24% operational silver recovery and Lower Siebert was assigned a 17% operational silver recovery.

It is anticipated that the contractor will have between 60 and 80 operators and staff involved with the operation. It has been assumed that the contractor will work 12-hour shifts, 2 shifts per day, 7 days per week. Other mine personnel will be maintained by the owner for general activities, including mine supervision, engineering, surveying, geology, and ore control.

All mining will be above the water table, so no dewatering wells will be required. Storm water that enters the pit will be handled by sumps in the pit as needed. Any excess water that does not naturally infiltrate into the ground will be placed in water trucks using a portable pump and then used for dust control on haul roads.

1.13 MINERAL PROCESSING

The Hasbrouck Project will utilize two separate heap-leach facilities to be located approximately five miles apart. The Three Hills Mine will be constructed and operated first, and will be a 15,000 ton per day, ROM operation, utilizing conventional, cyanide heap leaching of ore stacked on a single use pad. Gold will be leached with dilute cyanide solution and recovered from the solution using a carbon adsorption circuit. Loaded carbon will be processed offsite by "toll-stripping" where the carbon is stripped of metal in a desorption-recovery plant, regenerated, then returned for re-use.

The Hasbrouck Mine will be constructed after production commences at the Three Hills Mine so as to be ready to produce when Three Hills Mine ceases production after two years and will be a 17,500 ton per day heap-leach operation utilizing conventional heap leaching of crushed ore stacked on a single-use pad. Crushing will be performed in three stages: mined ore will pass first through a primary jaw crusher, then through two secondary cone crushers, and then through a high-pressure grinding-roll unit. Agglomeration with cement will be required prior to stacking of ore on the heap. Gold and silver will be leached with a dilute cyanide solution and recovered using an on-site carbon adsorption-desorption-recovery ("ADR") process to produce Doré bars.

1.14 PROJECT INFRASTRUCTURE - WATER, POWER, AND BUILDINGS

Water for both the Three Hills and Hasbrouck mines is planned to be obtained from two wells that will be drilled near the Three Hills Mine. High-density polyethylene ("HDPE") pipelines will be installed from the wells to a 500,000-gallon water storage tank at the Three Hills Mine where it will be stored for use as process make-up and fire water. Water from this source will be piped overland from the Three Hills Mine to the Hasbrouck Mine.

Exemption from the requirement for a potable water supply at the Three Hills Mine has been obtained from the Nevada Bureau of Safe Drinking Water, as the offices and assay lab are planned to be established in Tonopah. A potable water system will be installed at Hasbrouck Mine. This requires obtaining a water right to appropriate groundwater. Water rights are available for lease or purchase from two mining companies, the town of Goldfield, Esmeralda County, and several landowners and ranchers.

Electrical power at the Three Hills Mine will be supplied by a generator fueled by liquefied natural gas. Power at the Hasbrouck Mine will be supplied by NV Energy, the regional power distribution company. An overhead powerline will be installed connecting the switching station to the Hasbrouck Mine.

The estimated connected load at the Three Hills mine site (not including the laboratory which is to be located in Tonopah) is 1.6 MW, with an average draw of 0.7 MW.

At the Hasbrouck Mine the attached load for the crushing system, the conveying and stacking system, the ADR plant and ancillary equipment is estimated to be 7.5 MW, with a demand of 5.5 MW.

Diesel-powered backup generators will be installed in the process area at each mine site to provide emergency power.

Administration, safety, mine operations, warehouse, assay laboratory (to be located in Tonopah for Three Hills Mine operation, and later at Hasbrouck Mine), process buildings, and process maintenance buildings are planned for the Hasbrouck Project. During the time that Three Hills Mine will be operated, buildings in Tonopah will be rented or purchased. During the time Hasbrouck Mine will be operated, three trailers of double- and triple-wide sizes will be installed for offices, safety, and conference and training purposes.

A full-service laboratory will be established, sized to process 100 solid samples per day and 150 solution samples per day. The laboratory will be installed in a building that is to be rented or purchased in the town of Tonopah.

The process shop and warehouse at Three Hills Mine will be a single, 2,900ft^2 steel building located near the carbon column ("CIC") adsorption circuit. The process shop and warehouse at Hasbrouck will be a 3,430ft^2 steel building located near the ADR plant.

The reagents storage building at the Hasbrouck Mine will be 1500 ft^2. The ADR plant will be a steel building approximately 145ft x 42ft x 44ft high. An additional section approximately 14ft x 25ft x 20ft high for the caustic area will be attached to the ADR section. The refinery will be approximately 79.5ft x 44.5ft x 22.75ft high and will share a wall with the ADR building. The refinery area will contain a secure space for a safe.

1.15 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL IMPACT

Mineral exploration at both Three Hills Mine and Hasbrouck Mine is authorized by the U.S. Bureau of Land Management ("BLM") under multiple Notices, each of which authorizes up to five acres of disturbance and is bonded with the BLM. Existing disturbances and bond amounts for each Notice are shown in Table 1-10.

Table 1-10. Existing Disturbance and Notices for the Hasbrouck Project

Notice #	Disturbance Acreage	Bond Amount
NVN-91216	4.88	$65,450.00
NVN-89964	1.84	$14,033.00
NVN-89750	4.53	$18,758.00

On purchasing the properties in 2014, WVM chose to permit the Three Hills and Hasbrouck mines separately in order to take advantage of the fact that Three Hills Mine could be permitted under the relatively short and simple environmental assessment process rather than the much longer environmental impact statement process that might have been required if the two mines had been permitted as one operation. This decision resulted in obtaining key permits to construct and operate the Three Hills Mine by June 2016. WVM started work on obtaining the federal permit and state reclamation permit to construct, operate, and close Hasbrouck Mine in November, 2016, with the federal permit and state reclamation permit being issued in November, 2020, which will allow continuous production at the Hasbrouck Mine when the Three Hills Mine comes to an end.

1.16 CAPITAL AND OPERATING COSTS

RESPEC has authored Section 21.0, Capital and Operating Costs, with subsections for Process Capital and Process Operating costs provided by KCA (Kappes, Cassiday & Associates). NewFields has provided inputs for Processing Capital and some input to Infrastructure Capital Costs, which are included in the Other Capital Costs (Section 21.9).

All units are US currency.

Capital costs of $66,172,000 at the start of the project are attributed to the startup of Three Hills Mine, which includes $4,864,000 of working capital. $127,310,000 in capital is required as "Growth" capital for the startup of Hasbrouck which is primarily funded by revenues from the Three Hills Mine. Sustaining capital was estimated to be $28,571,000 which includes the return of working capital. Total life-of-project capital is $222,053,000. Direct capital costs include sales tax. Capital costs are shown in Table 1-11.

Table 1-11. Hasbrouck Project Capital Cost Summary

Direct Costs	**Units**	**Initial**	**Growth**	**Sustaining**	**Total**
Pre-Production	K USD	$ 5,021	$ 190		$ 5,211
Mining	K USD	$ 184	$ 77	$ 127	$ 388
Plant and Recovery	K USD	$ 15,584	$ 64,603	$ -	$ 80,187
Leach Pads	K USD	$ 11,132	$ 14,713	$ 13,613	$ 39,458
Ponds and Site Infrastructure	K USD	$ 3,291	$ 4,981	$ -	$ 8,272
Water Supply	K USD	$ 5,747	$ 5,895	$ -	$ 11,641
Roads	K USD	$ 907	$ 1,501	$ -	$ 2,409
Environmental	K USD	$ -	$ -	$ -	$ -
Light Vehicles	K USD	$ 712	$ 160	$ 490	$ 1,363
Site and Administration	K USD	$ 47	$ 77	$ -	$ 124
Safety & Security	K USD	$ 82	$ 5	$ 10	$ 97
Owner's Capital	K USD	$ 6,247	$ 2,024	$ 12,484	$ 20,754
Total Direct Costs	K USD	$ 48,953	$ 94,227	$ 26,723	$ 169,904
Indirect Costs					
Initial Fills	K USD	$ 211	$ 470	$ -	$ 681
Indirects	K USD	$ 1,895	$ 3,099	$ 613	$ 5,607
EPCM	K USD	$ 2,721	$ 9,417	$ 749	$ 12,887
Newmont Buyout	K USD	$ -	$ 1,000	$ -	$ 1,000
Total Indirects	K USD	$ 4,827	$ 13,986	$ 1,361	$ 20,175
Contingencies					
Mining (15%)	K USD	$ 395	$ 30	$ -	$ 425
Plant and Recovery (20%)	K USD	$ 3,000	$ 12,240	$ -	$ 15,240
Leach Pads (15% - 25%)	K USD	$ 1,670	$ 3,678	$ 3,403	$ 8,751
Roads, Ponds, Water, and Infrastructure (25%)	K USD	$ 1,399	$ 2,808	$ -	$ 4,208
Other (15%)	K USD	$ 1,063	$ 340	$ 1,948	$ 3,351
Total Contingency	K USD	$ 7,528	$ 19,096	$ 5,351	$ 31,975
Total Capital Cost	K USD	$ 61,308	$ 127,310	$ 33,435	$ 222,053
Working Capital	K USD	$ 4,864	$ -	$ (4,864)	$ -
Net Capital on Summary Sheet	K USD	$ 66,172	$ 127,310	$ 28,571	$ 222,053

Mining and re-handle operating costs were estimated based on contractor quotations. Processing operating costs were estimated by KCA and provided to RESPEC in the form of fixed and variable costs. These costs were then applied to the process schedule by RESPEC to generate the LOM processing costs General and Administrative costs and Nevada's net proceeds tax were estimated by RESPEC. Reclamation costs were estimated by Westland Engineering & Environmental Services, using BLM reclamation cost estimate spreadsheets. These reclamation costs were reviewed by Mr. Paul Sterling, a consultant to WVM, and are found to be acceptable to RESPEC QP's.

The total cost per ton processed for all ore is $10.36 per ton processed. Table 1-12 shows a summary of the operating cost estimate.

Note that Table 1-12 shows an operating cost of $10.02 per ton based on the World Gold Council Adjusted Operating Cost definition. This apparent discrepancy is due to the inclusion of silver credits and exclusion of reclamation costs in the World Gold Council definition.

Table 1-12. Operating Cost Summary

Operating Costs		K USD	USD per ton Processed
Three Hills	Mining Cost	$ 37,008	$ 3.83
	Process Cost	$ 32,145	$ 3.33
Hasbrouck	Mining Cost	$ 140,156	$ 1.86
	Process Cost	$ 173,301	$ 5.04
	Re-handle	$ 4,210	$ 0.12
Total	Mining Cost	$ 177,163	$ 4.02
	Process Cost	$ 205,446	$ 4.67
	Re-handle	$ 4,210	$ 0.10
	G&A Cost	$ 22,804	$ 0.52
	Reclamation - Three Hills	$ 7,030	$ 0.16
	Reclamation - Hasbrouck	$ 8,766	$ 0.20
	Net/Gross Proceeds	59%	
	Nevada Net Proceeds Tax	$ 30,538	$ 0.69
	Net Operating Cost	$ 455,957	$ 10.36

1.17 ECONOMIC ANALYSIS

RESPEC completed an economic analysis based on the cash flow developed from the production schedule and the capital and operating costs previously discussed. Table 1-13 shows a summary of key information for the Hasbrouck Project. The life-of-Project after-tax net present value is $206.2 million using a 5% discount rate. The payback period is 2.9 years, and the internal rate of return is 51.4%. These values are based on 100% of the project.

Hasbrouck Project economic results are shown in Table 1-13.

Table 1-13. Hasbrouck Project Highlights Based on 100% of the Project

	Units	Three Hills Mine	Hasbrouck Mine	Total Hasbrouck Project
PROJECTED HEADGRADE	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.58	0.017 - 0.59
Preliminary Reserve Values				
Ore	million tons	9.65	34.37	44.0
Annual Ore	million tons	4.8	6.3	5.9
Processing Rate	tons per day	15,000	17,500	15,892
Stripping Ratio	waste:ore	0.86	1.19	1.12
Contained Metal				
Gold Grade	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.58	0.017 - 0.59
Silver Grade	oz Ag/ton - g Ag/t	NA	0.306 - 10.48	0.239 - 8.18
AuEq Grade (1)	oz AuEq/ton - g AuEq/t	0.018 - 0.62	0.018 - 0.61	0.018 - 0.61
Gold	kOz	175	578	753
Silver	kOz	NA	10,504	10,504
AuEq (1)	kOz	175	610	785
Recoverable Metal				
Gold Recovery	%	82.7%	72.1%	74.6%
Silver Recovery	%		18.3%	18.3%
Gold	kOz	144	417	561
Silver	kOz	NA	1,918	1,918
AuEq ($1,275/$18.21)	kOz	144	441	585
Average Annual Gold Production	kOz	71	69	70
Averge Annual Silver Production (2)	kOz	NA	319	319
Average Annual AuEq Production	kOz	71	73	74
Gold Price	US$/oz	$ 1,790	$ 1,790	$ 1,790
Silver Price	US$/oz	$ 22.50	$ 22.50	$ 22.50
CAPITAL				
Initial Capex	US$ million	$ 66.2		
Sustaining & Growth Capex	US$ million		$ 155.9	
Growth Capex	US$ million		$ 122.7	
Sustaining Capex	US$ million		$ 33.2	
LOM Capex	US$ million			$ 222.1
Contingency (included)	US$ million	$ 7.5	$ 24.4	$ 32.0
Contingency (included)	%	13%	19%	17%
Working Capital	US$ million	$ -		$ -
FUNDING				
Funding Requirement (at year -1)		$ 66.2		
Free Cash Flow from Three Hills		$ 159.2		
Funding Requirement (at year 1)(3)			$ (32.1)	
Total Funding Requirement				$ 34.1
Adjusted Operating Cost per Ton of Ore (3)	US$/ton ore	$ 9.81	$ 10.08	$ 10.02
Mining	US$/ton ore	$ 3.83	$ 4.20	$ 4.12
Processing	US$/ton ore	$ 3.33	$ 5.04	$ 4.67
G&A	US$/ton ore	$ 0.71	$ 0.46	$ 0.52
Other (4)	US$/ton ore	$ 1.94	$ 0.38	$ 0.72
Adjusted Operating Cost (3)	US$/oz Au net of by-products	$ 656	$ 831	$ 786
All-in Sustaining Cost (5)	US$/oz Au net of by-products	$ 701	$ 938	$ 877
All-in Cost (6)	US$/oz Au net of by-products	$ 1,125	$ 1,232	$ 1,205
Mine Life	year	1.7	7.0	8.7
NPV (5%) - pre-tax	US$ million			$ 239.6
IRR - pre-tax	%			57.1%
NPV (5%) - after tax	US$ million			$ 206.2
IRR - after tax	%			51.4%
Payback Period	year			2.9

Notes:

1. Gold equivalent calculations are made using the ratio of recovered silver / gold and metal prices.
2. Silver production is averaged over the Hasbrouck Mine life only
3. World Gold Council - Adjusted Operating Costs include:
   - On-site mining and G&A, royalties and production taxes, permitting and community cost related to current operations,3rd party smelting, refining and transport costs, stockpiles and inventory write-downs, site-based non-cash remuneration, operational stripping costs and by-product credits. Other category includes royalties, production taxes, permitting, refining, and by-product credit
4. World Gold Council All-in Sustaining Costs includes:
   - Adjusted Operating Costs (above) plus corporate G&A, reclamation & remediation—accretion & amortization, expenditures sustaining exploration and study costs, capital exploration, capitalized stripping and sustaining capital.
5. World Gold Council - All-in Sustaining Costs includes:
   - Adjusted Operating Costs (above) plus corporate G&A (including share-based remuneration), reclamation & remediation - accretion & amortization (on-site), sustaining exploration and study costs, sustaining capital exploration, capitalized stripping and sustaining capital expenditure.
6. Project economics are presented for 100% of the project which is owned by WVM (100%).
7. Some totals may not sum properly due to rounding.

1.18 PROJECT SENSITIVITY

Project sensitivities were analyzed with respect to gold price, revenues, operating costs, and capital costs. As with most precious metal projects, the Hasbrouck Project is most sensitive to gold price and revenue. Table 1-14 shows the sensitivity analysis by gold price with the base case price of $1,790 $/oz Au highlighted. Figure 1-1 shows the Project sensitivity to changes in revenue, operating costs, and capital costs graphically.

Table 1-14. After-Tax Project Sensitivity

After Tax Sensitivity - Metal Price (K USD)						
Au Price	Undisc. CF	NPV 5%	NPV 8%	NPV 10%	IRR	Ag Price
$ 1,200	$ (10,541)	$ (22,598)	$ (28,119)	$ (31,190)	-3%	$ 15.08
$ 1,300	$ 41,266	$ 17,295	$ 6,353	$ 212	10%	$ 16.34
$ 1,400	$ 92,298	$ 56,585	$ 40,303	$ 31,139	20%	$ 17.60
$ 1,500	$ 142,515	$ 95,277	$ 73,749	$ 61,615	29%	$ 18.85
$ 1,600	$ 192,876	$ 134,071	$ 107,280	$ 92,167	37%	$ 20.11
$ 1,700	$ 242,466	$ 172,262	$ 140,286	$ 122,237	45%	$ 21.37
$ 1,790	$ 286,438	$ 206,159	$ 169,594	$ 148,946	51%	$ 22.50
$ 1,900	$ 340,186	$ 247,590	$ 205,416	$ 181,591	60%	$ 23.88
$ 2,000	$ 388,886	$ 285,127	$ 237,870	$ 211,166	67%	$ 25.14
$ 2,100	$ 436,784	$ 322,061	$ 269,812	$ 240,279	74%	$ 26.40
$ 2,200	$ 484,679	$ 358,994	$ 301,752	$ 269,392	82%	$ 27.65
$ 2,300	$ 532,561	$ 395,915	$ 333,681	$ 298,494	89%	$ 28.91
$ 2,400	$ 579,590	$ 432,100	$ 364,935	$ 326,956	96%	$ 30.17
$ 2,500	$ 626,034	$ 467,890	$ 395,876	$ 355,152	103%	$ 31.42
$ 2,600	$ 672,126	$ 503,418	$ 426,596	$ 383,149	110%	$ 32.68

$1,790/oz Au Base Case is highlighted

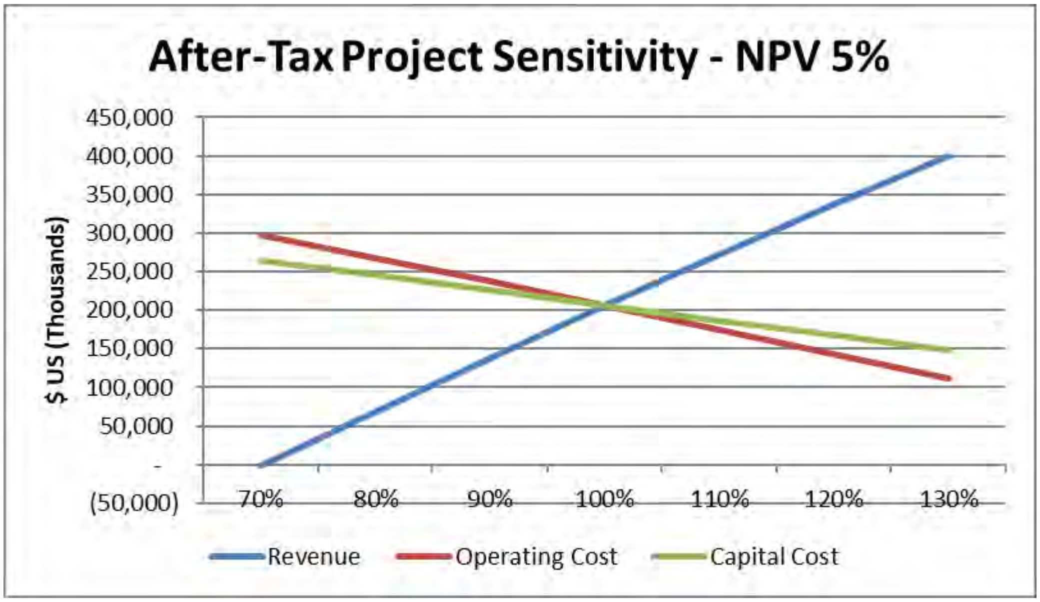

Figure 1-1. After-Tax Project Sensitivity

1.19 RISKS AND OPPORTUNITIES

RESPEC has identified a number of external and internal risks and opportunities that may affect the economics of the Hasbrouck Project.

External Risks

- The Project's economic viability is generally at risk from changes in external factors which would lead to increases in input costs (construction costs, operating costs), to schedules being stretched, or a fall in the price of gold or silver which would reduce revenue.
- A decrease in gold or silver price would not only reduce revenue but would also reduce the amount of economically minable ore as a decrease in metal prices would result in a higher cut-off grade. Under the current gold price environment, the Mineral Reserves are considered robust. It should be noted that the configuration of the deposits comprise the Mineral Resource and Mineral Reserves are relatively insensitive to changes in cut-off grade.
- While no environmental and permitting risks are currently identified, and all key permits are in-hand for the Three Hills Mine and a federal and state reclamation permit are in hand for Hasbrouck Mine, this is an area where risk to cost and schedule generally exist.

Internal Risks

- Current drill spacing is deemed adequate to define the Mineral Resources and Mineral Reserves reported herein and there is a low risk of a decrease in Mineral Resources due to additional drilling and subsequent re-modeling and re-estimations.
- The Project's economic viability is generally at risk from internal factors such as poor construction or operational execution resulting in construction and commissioning cost and schedule over-runs and scope creep poor equipment and process plant performance, and increased operating costs. This is mitigated by ensuring experienced management oversees construction and commissioning.

- During construction and startup at Hasbrouck Mine there is a potential to cast material down towards the highway during mining operations. RESPEC has assumed that the lower portion of a berm will be constructed with initial waste material to capture any slough from the hillside.
- Blasting could also provide a hazard to travel on the highway near Hasbrouck. During mining operations, the direction of blasting will be important to ensure movement of materials is away from the highway side of the pit. For initial mining prior to the formation of a highwall, the highway will need to be shut down during blasting operations.
- There are generic risks associated with the operation of this project as with any other project of this type such as fuel costs, labor availability, management, community affairs, all of which may change as the project progresses.
- There is a risk that permeability in a full-scale heap leach at Three Hills Mine will be inadequate, based on testing done on a ROM bulk sample by KCA in 2014. The ROM bulk sample was taken at the surface and the area where it was taken showed signs of weathering. Crushed column samples taken from core at depth did not demonstrate any issues with permeability during leaching. Additional testing is required to define the level of risk for this issue. The risk of low percolation rates can be mitigated by performing field permeability tests on ROM ore during the early phase of mining and making appropriate adjustments to methods of stacking and leaching. Thus, during initial leaching operations at Three Hills, percolation will be closely monitored to observe the percolation rate, allowing early adjustments to be made as necessary. Early adjustments include installing intermediate drains in the heap at various elevations as the heap grows in height. While this would increase costs somewhat, it is a viable and proven technique which can be implemented simply and quickly should a risk of low percolation rates be identified.
- The predicted gold recovery at Three Hills is based on results for crushed material in column tests. The recommended processing method is a ROM heap leach, which is not crushed. Gold deportment was determined to be along fractures and in brecciated zones. There is a risk that the drilling and blasting associated with a normal mining operation might not fracture the ore sufficiently to expose the gold to leaching, which could result in lower recoveries.
- The predicted gold recovery at Hasbrouck is extrapolated based on the effect of HPGR crushing of a composite sample. Variability sampling is required to ensure that the effect of HPGR crushing can be applied to all of the Mineral Resource material.
- This study contemplates using certain pieces of mobile crushing and screening equipment at the Hasbrouck Mine that will tend to have a fall-off in availability and higher maintenance costs over time when compared to non-mobile equipment. Thus, the availability factor in this study may have been overstated.
- If the current off-site toll carbon processor cannot handle all the loaded carbon, then the operating costs will increase due to the higher cost of selling the loaded carbon to an ashing refiner and purchasing new carbon each cycle.
- Fuel price used in this study for contract mining is $3.25 per gallon (note that fuel taxes are not applicable and have not been included) based on anticipated long-term fuel costs. Should the cost of fuel rise, mining costs will be adversely affected. Note that the opposite can be true if fuel prices drop.
- Geotechnical studies are preliminary at Hasbrouck Mine and additional drilling is recommended to raise the level of certainty for final pit slope angles. There is a risk that additional geotechnical studies might result in flatter pit slopes than used in this study, which would have an adverse impact on costs and Mineral Reserves. The impact of flatter slopes is considered minimal because a large portion of the mining is above the crest of the ultimate pit where pit-slope angle is not a factor.

- Finding and keeping the skilled employees required to operate the Hasbrouck Project might prove challenging, given its rural location. Inadequate staffing would tend to increase operating costs by reducing operating efficiencies and increasing repair and maintenance costs. Recruiting costs might be higher than predicted.

Opportunities

- Additional drilling along the periphery of the Three Hills and Hasbrouck mines has the potential to extend the Mineral Resources to the east and west at the Hasbrouck Mine, and to the east and southeast at the Three Hills Mine. Such expansion could improve the Project economics by reducing waste, extending the LOM and increasing overall revenues and profitability.
- Additional drilling could also result in reclassification of in-pit Mineral Resources from Inferred to Indicated, and from Indicated to Measured. Within the two pits there are 3.3 million tons of Inferred Mineral Resources that are currently treated as waste. Any upgrade of Inferred material to Indicated or higher classification would tend to improve the Project economics by increasing ore tonnage and reducing waste tonnage, thereby reducing the strip ratio, extending the LOM and increasing overall revenues and profitability.
- Engaging contractors more closely in the mine planning and design might result in identifying cost-reductions.
- Mining operating costs may be reduced by WVM deciding to operate the mine using their own equipment and employees, thus avoiding paying the contractor's profit. The increase in initial and sustaining capital for mining equipment might be mitigated by leasing equipment.
- Additional geotechnical studies might result in pit slopes being steepened, leading to a smaller amount of waste rock to be mined per ton of ore. Geotechnical information gained from mining operations at Three Hills may help geotechnical understanding of the Hasbrouck mine in common geotechnical domains, which may allow for further steepening of the Hasbrouck Mine pit slopes.
- HPGR crushing and micro-fracturing performance might be understated in the laboratory due to the very short time that samples took to be crushed in the laboratory-scale HPGR, typically measured in seconds or, for larger samples, several minutes. Such short runs do not allow time to optimize HPGR settings. It is expected that under steady-state running at full-scale, fine tuning of crushing parameters, such as the amount of choke feeding, recirculation, roll rotation speed, roll spacing, and roll closing force, will result in greater efficiency in crushing and micro-fracturing which in turn will result in higher gold and silver recovery than indicated by laboratory scale tests.
- The HPGR model selected for this study was a first-pass choice. A larger machine would allow a greater amount of recirculation which would result in a finer product size and consequently a greater recovery of gold and silver.
- Faster gold recovery from solution, and hence more efficient operation, might be achieved at the Hasbrouck Mine by increasing the number of carbon columns in the adsorption plant from 5 to 6.
- Additional metal recovery from both the Three Hills and Hasbrouck mines might occur beyond the leach cycle time assumed in this study.
- The overall design of the crushing and screening plant presented in this study is a first-pass design and was not reviewed by other equipment suppliers. The opportunity exists to optimize the crushing and screening plant general arrangement and individual components, with the help of other equipment suppliers' input. Areas that are especially targeted for review include the configuration of grizzlies at the primary crusher (both static and vibrating), and conveyor layouts to and from the secondary crushers.

- A pug mill was included in the Hasbrouck Mine process plant to address the concern that the HPGR might under wet weather conditions produce "cake" rather than granular particles, which might occur when there is sufficient clay-sized material and moisture in the HPGR feed. Caked material would tend to reduce agglomeration and access of solutions to the ore once place in the heap. Planning to pass all crushed ore through the pug mill, as has been assumed in this study, is conservative as in reality the pug mill will only be required under moist conditions when clay is present in the ore, which is a small percentage of the time; for the majority of the time ore can by-pass the pug mill, with mixing of cement and ore being achieved at the various conveyor transfer points. Reducing the operating time of the pug mill would reduce operating costs.
- The various construction and capital equipment costs used in this study are based on budget costs obtained from one source in each case. It is possible that lower costs might be achieved by competitive bidding.
- The earthworks component of civil construction might be performed in part, or all, by mining equipment. This could reduce construction costs as mining equipment tends to operate at lower unit costs than civil equipment. Additionally, using mining equipment might eliminate the need for mobilization and de-mobilization of construction equipment, which would offer further cost savings.
- Predicted consumption of cyanide at the Three Hills and Hasbrouck mines was based on data from column leach tests using 500 ppm NaCN concentrations. It is common in many heap leach operations to utilize a lower cyanide concentration than predicted by laboratory-scale testing. Typical field concentrations can be in the range of 125-250 ppm where the ore is relatively free of significant cyanide-consuming constituents. Actual consumption may be lower than has been assumed in this study; a lower cyanide concentration would lead to lower operating costs and higher profitability.
- It may be possible to reduce operating costs by optimizing crew rotations and hours.
- Mobile equipment has been included in the Hasbrouck crushing circuit design. A thorough review of the crushing system using stationary equipment could identify possible design changes that could result in lower operating costs.

1.20 RECOMMENDATIONS

WVM does not intend to complete additional studies or testing in advance of commencing construction and operation at the Three Hills Mine, given that WVM has performed internal engineering, scheduling and planning in preparation for proceeding to construction that have advanced the Project beyond the level of studies.

RESPEC makes the following recommendations for studies in advance of commencing construction and operation at the Three Hills and Hasbrouck Mine as shown in Table 1-15.

Table 1-15. Hasbrouck Mine Studies Recommendations

Three Hills Mine Metallurgy Test Work	$50,000
Hasbrouck Mine Metallurgy Test Work	$500,000
Hasbrouck Mine Geotechnical Work	$360,000
Total Recommended Budget	$910,000

The estimated costs of the recommendations total $910,000. Additional exploration drilling is not included in the immediate production recommendations. However, Three Hills will benefit from additional drilling to the east and northeast of the main deposit in the future, and there is potential for Mineral Resource expansion along trend to the west and east at Hasbrouck.

2.0 INTRODUCTION AND TERMS OF REFERENCE

RESPEC has prepared this Technical Report and updated Preliminary Feasibility Study ("PFS") on the Hasbrouck gold-silver project, located in the State of Nevada, USA, at the request of West Vault Mining Inc. ("WVM"), a Canadian company formerly known as West Kirkland Mining Inc. ("WKM"). This update builds on the 2016 PFS Technical Report titled "*Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project Esmeralda County, Nevada*" ("2016 PFS") prepared for WKM by Dyer et al. (2016) of Mine Development Associates ("MDA"). The purpose of this Technical Report is to present an updated and enhanced PFS for the Hasbrouck gold-silver project with improved project economics based on more detailed, reduced estimates of capital and operating costs, and a slight increase in gold recovery at the end of the mine life.

WVM is listed on the Toronto Venture Exchange ("TSX.V") under the symbol "WVM". In January 2014, WVM's predecessor WKM announced it had entered into an agreement with Allied Nevada Gold Corp. ("Allied") to acquire up to a 100% interest in Allied's Hasbrouck and Three Hills gold-silver properties (the "Hasbrouck Project"). WKM subsequently has announced that its subsidiary WK Mining (USA) Ltd. completed the acquisition of an initial 75% interest in the Hasbrouck Project. On September 11, 2014, WK Mining (USA) entered into a mining lease to purchase agreement with Eastfield, covering seven patented mining claims that became part of the property. Total consideration to be paid over the life of the lease is CDN$280,000, of which CDN$30,000 has been paid. On June 19, 2015, Allied announced that the United States Bankruptcy Court for the District of Delaware had approved the sale of Allied's exploration properties and related assets (excluding the Hycroft operation) to Clover Nevada LLC ("Clover Nevada"), a wholly-owned subsidiary of Waterton Precious Metals Fund II Cayman, LP ("Waterton"), including Allied's 25% interest in the Hasbrouck Mine. The sale does not materially affect the contractual rights of WVM and WVM holds the title to the Hasbrouck property. WVM's previous name, West Kirkland Mining Inc., changed to WVM on July 2, 2020 upon the market open of the TSX:WVM when WVM purchased the remaining 25% interest in Hasbrouck Mine from Waterton. In this report the term WVM is used to refer to West Vault Mining Inc., and both West Kirkland Mining Inc., and WK Mining (USA), interchangeably.

Gold and silver mineralization occurs at Three Hills Mine, Hasbrouck Mine and Hill of Gold in high-level, low-sulfidation, hot spring-type epithermal systems. Technical Reports by Prenn (2003, 2006) and Prenn and Gustin (2003, 2006) have provided previous descriptions of the Three Hills and Hasbrouck mines separately. An earlier description of the Three Hills Mine was given by Hardy (1996). The two deposits have also been described jointly in Technical Reports by Flint et al. (2012), Wilson (2014), and most recently by Tietz et al. (2015) and Dyer et al. (2016). Mineralization at the Hill of Gold area of the property, acquired by WVM in 2020, was briefly described by Hardy and Ristorcelli (1996).

2.1 PROJECT SCOPE AND TERMS OF REFERENCE

This report has been prepared to comply with the Disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" adopted by the CIM Council on May 10, 2014 and the Guidelines adopted November 29, 2019 ("CIM Standards"). This report has been prepared under the supervision of Thomas L. Dyer, P.E., Senior Engineer for RESPEC, and Jeff Bickel, Senior Geologist for RESPEC, with contributions from Mark Jorgensen of Jorgensen Engineering and Technical Services ("JE&TS"), Ryan Baker, Senior Engineer for NewFields, and Carl E. Defilippi, Senior Engineer for Kappes, Cassiday & Associates ("KCA"). The current Mineral Resources reported herein were estimated and classified under the supervision of Mr. Jeff Bickel as defined by the CIM Standards and NI 43-101. The PFS and current Mineral Reserves were prepared under the supervision of Mr. Dyer and were estimated and classified as defined by the CIM Standards and NI 43-101. Mr. Dyer, Mr. Bickel, Mr. Jorgensen, Mr. Baker, and Mr. Defilippi are Qualified Persons under NI 43-101. There is no affiliation between Mr. Dyer, Mr. Bickel, Mr. Jorgensen, Mr. Baker, and Mr. Defilippi and WVM, except that of independent consultant/client relationships. Mr. Dyer and Mr. Bickel were formerly employed by MDA. MDA was acquired by RESPEC in 2019. The term RESPEC refers to both MDA and RESPEC.

The scope of this study included a review of pertinent technical reports and data provided to the authors by WVM relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. The authors have relied on the data and information provided by WVM for the completion of this report.

Mr. Bickel, Mr. Dyer, and Mr. Jorgensen visited the Hasbrouck Project on September 12, 2022. The site visit included a field traverse and overview of each deposit on the Project, review of metallurgical sample collection points, review of mining and infrastructure plans for each deposit, and a review of Project geology including inspection of drill core at WVM's core facility in Tonopah. The September 12, 2022 site visit followed inspections by Mr. Paul Tietz, Senior Geologist and QP for RESPEC on July 25, 2014, and on September 12, 2012 of Project drill core stored at Allied's Hycroft Mine near Gerlach, Nevada, and at KCA in Reno, Nevada. During these site visits, Mr. Tietz reviewed the Project geology and drill locations with Project personnel. Mr. Dyer visited the Hasbrouck Project on May 1, 2014, and inspected drill core in June, 2014 with Mr. Tietz at KCA's facility. Mr. Defilippi conducted site visits at Hasbrouck and Three Hills mines on May 1, 2014 and January 31, 2023, at which time he inspected the properties and pertinent local infrastructure.

The authors have relied almost entirely on data and information provided by WVM and previous companies involved with the project. The authors have reviewed much of the available data, made site visits, and have made judgments about the general reliability of the underlying data. Where deemed either inadequate or unreliable, the data was either eliminated from use or procedures were modified to account for lack of confidence in that specific information. Mr. Dyer, Mr. Bickel, Mr. Jorgensen and Mr. Defilippi have made such independent investigations as deemed necessary in their professional judgment to be able to reasonably present the conclusions discussed herein.

The Effective Date of this Technical Report and the PFS is January 11, 2023, which is the date of the revised cash-flow model as described in WVM's January 23, 2023 press release on the Project economics. The Effective Date of the Three Hills Mine Mineral Resource Estimate is December 15, 2022. The Effective Date of the Hasbrouck Project Mineral Resource Estimate is December 15, 2022. A total of 14 holes at Three Hills Mine and 14 holes at Hasbrouck Mine were drilled by WVM in late 2014, and one hole was drilled at Hasbrouck in 2018. This information has been evaluated by Mr. Bickel. It is Mr. Bickel's opinion that WVM's 2014 and 2018 drilling would not materially change the Mineral Resource Estimate and is not material to the conclusions of the PFS. For this reason, the 2014 Mineral Resource databases have not been updated to include the WVM drilling of 2014 and 2018.

2.2 FREQUENTLY USED ACRONYMS, ABBREVIATIONS, DEFINATIONS, AND UNITS OF MEASURE

In this report, measurements are given in Imperial units, except where the original information was reported in metric units. Assays have been reported in the manner in which they were received; all early work is in Imperial units (troy oz/short ton), and more recent work is reported in ppm.

Currency, units of measure, and conversion factors used in this report include:

Linear Measure		
1 centimeter	= 0.3937 inch	
1 meter	= 3.2808 feet	= 1.0936 yard
1 kilometer	= 0.6214 mile	
Area Measure		
1 hectare	= 2.471 acres	= 0.0039 square mile
Capacity Measure (liquid)		
1 liter	= 0.2642 US gallons	
Weight		
1 tonne (metric)	= 1.1023 short tons = 2,205 pounds	
1 kilogram	= 2.205 pounds	
1 troy ounce (oz)	=31.1034768 grams	

Currency: Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

Frequently used acronyms and abbreviations are listed in Table 2-1.

Table 2-1. List of Units, Acronyms, and Abbreviations

AA	atomic absorption spectrometry
ADR	adsorption-desorption-recovery
Ag	silver
As	arsenic
Au	gold
AuEq	gold equivalent
Bi	bismuth
CF	cash flow
CIC	carbon column
C.P.G.	Certified Professional Geologist
CRM	certified reference materials
Cu	copper

cuft/ton	cubic feet per imperial short ton
F	Fahrenheit
ft	feet
G&A	General and Administrative
g	grams
g/t	grams per tonne
gal	gallons (US)
gal/h	gallons (US) per hour
gal/min/ft^2	gallons (US) per minute per squared feet
gal/year	gallons (US) per year
GCL	Geosynthetic clay liner
g/cm^3	grams per cubic centimeter
GMV	Gross Metal Value
gpm	Gallons (US) per minute
gpm/ft^2	Gallons (US) per minute per squared feet
GPS	Global Positioning System
GSR	gross smelter return
Hg	mercury
HDPE	high-density polyethylene
HLF	heap-leaching facility
hp	horsepower
HPGR	high-pressure grinding roll
ICP	inductively coupled plasma analytical method
ICP-AES	inductively coupled plasma atomic emission spectroscopy analytical method
ICP-MS	inductively coupled plasma mass spectrometry analytical method
in	inch or inches
IRR	Internal rate of return
JCR	joint condition rating
K	thousands
K-Ar	potassium argon dating
kg	kilogram
km	kilometers
kV	kilovolt
kWh	kilowatt hour
kWh/year	kilowatt hour per year

kWh/ton	kilowatt hour per imperial short ton
lbs	pounds
lbs/day	pounds per day
lbs/ft^3	pounds per cubic foot
lbs/ton	pounds per imperial short ton
lbs/wk	pounds per week
lb NaCN/ton	pound sodium cyanide per imperial short ton
LLC	limited liability company
LNG	liquified natural gas
LOM	Life of Mine
µm	micron
m	meters
Ma	million years old
MC	moisture content
mi	mile or miles
mil	one thousandth of an inch (0.0254mm)
mm	millimeters
Moz	million troy ounces
mph	miles per hour
MPO	Mine Plan of Operation
MW	megawatt
NaCN	sodium cyanide
NPT	net proceeds tax
NPV	net present value
NSR	net smelter return
oz	troy ounce
ozs	troy ounces
oz/ton	troy ounce per imperial short ton
opt	troy ounce per imperial short ton
P70	crushed to 70% passing through a specified screen size.
P80	crushed to 80% passing through a specified screen size.
Pb	lead
PbP	Pit by Pit
P.E.	Professional Engineer
PFS	Preliminary Feasibility Study

ppb	parts per billion
ppm	parts per million
PSA	purchase and sale agreement
psi	pounds per square inch
psig	pounds per square inch at gauge
QA/QC	quality assurance and quality control
QPs	Qualified Persons
RC	reverse-circulation drilling method
Mineral Resource Pit	optimized pit shell for the Hasbrouck Project Mineral Resources
RQD	rock-quality designation
ROM	Run of mine
Se	selenium
SMU	smallest mining unit
st	Short ton
Tl	thallium
T	Imperial short ton (2,000lb)
ton	Imperial short ton (2,000lb)
t	Metric ton (tonne)
Tpd or TPD	Short tons per day
Tph	Short tons per hour
USD	currency of the United States
V	volt
WRSA	waste rock storage areas
Zn	Zinc

3.0 RELIANCE ON OTHER EXPERTS

The authors are not experts in legal matters, such as the assessment of the legal validity of mining claims, private lands, mineral rights, and property agreements. The authors rely fully on information provided by Erwin & Thompson LLP[1] as to the title of the unpatented mining claims and private mineral rights comprising the Hasbrouck property, the terms of property agreements, and the existence of applicable royalty obligations. Sections 4. 2 and 4.3 are based on information provided by WVM, and the authors offer no professional opinions regarding the provided information.

The authors are not experts with regard to environmental permitting or liabilities. For Section 4.4 and Section 20.0 on Environmental Studies, Permitting and Social or Community Impact, the authors have relied on Mr. Richard Delong of EM Strategies, Inc., a WestLand Engineering & Environmental Services, Inc. ("WestLand"), who provided expertise to WVM for environmental and permitting issues. Mr. DeLong provided a document to WVM for these items, which was provided to RESPEC by WVM in a project communication email on December 29, 2022. Mr. Richard DeLong is a Certified Environmental Manager. Mr. Paul Sterling, a consultant to WVM, has provided WVM with information on reclamation costs.

The authors did not conduct any investigations of the social-economic issues associated with the Hasbrouck Project, and the authors are not experts with respect to these issues. The authors have relied fully on WVM to provide complete information concerning the legal status of the company and related companies, as well as current legal title and material terms of all agreements relating to the property. The authors are not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the Hasbrouck Project Mineral Resources or Mineral Reserves as of the date of this report.

[1] Erwin & Thompson, LLP, Confidential Legal Advice, File No. 93777.012, May 12, 2003

4.0 PROPERTY DESCRIPTION AND LOCATION

The authors are not experts in land, legal, environmental, and permitting matters. Section 4 is based on information provided to the authors by Erwin & Thompson, LLP[2]. Sections 4.2 and 4.3 were prepared from a document received from WVM on November 15, 2022. The authors do not know of any significant factors or risks that may affect access, title, or the right or ability to perform work on the property, beyond what is described in this report.

4.1 LOCATION

The Hasbrouck property includes the Three Hills gold mine and Hasbrouck gold-silver mine, located 2 miles west and 5 miles south of Tonopah, Nevada, respectively, as well as gold-silver mineralization at the Hill of Gold area (Figure 4-1). Tonopah is a historical mining town in south-central Nevada, approximately 4 hours by car southeast of Reno, and 3 hours northwest of Las Vegas, Nevada.

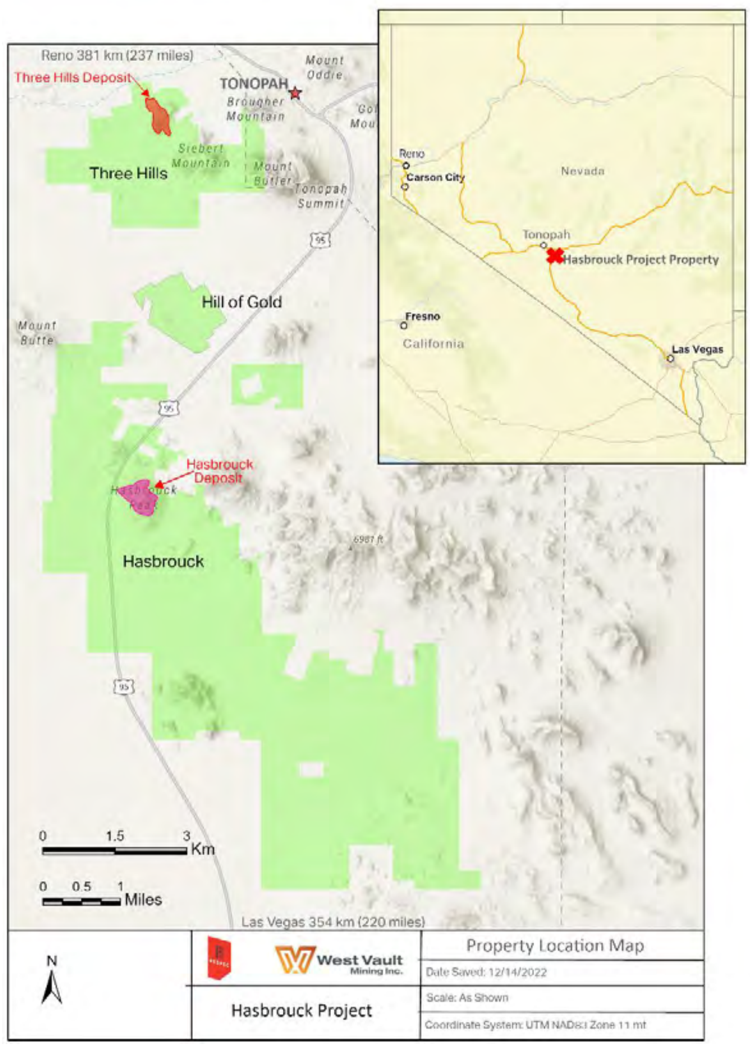

Figure 4-1 . Hasbrouck Property Location Map

[2] Erwin & Thompson, LLP, Confidential Legal Advice, File No. 93777.012, May 12, 2003

The topographic maps covering the project area are the Mount Butte, Klondike and Mud Lake 7.5-minute quadrangles, Nevada, at 1:24,000-scale, published by the U.S. Geologic Survey. The approximate center of the Hasbrouck Mine is at latitude 37°59'32" North and longitude 117°16'0" West, and the approximate center of the Three Hills Mine is at latitude 38°3'46" North and longitude 117°15'44' West.

4.2 LAND AREA

WVM acquired a 100% interest in the Hasbrouck Project in Nevada from subsidiaries of Allied Nevada Gold Corp and Waterton.

The Three Hills Mine (Figure 4-2) is covered by 14 patented claims and 100 unpatented lode claims (Appendix A) occupying a total of approximately 1,972 acres in Sections 2, 3, 4, 5, 8, 9, 10 and 11, T2N, R42E, and Sections 33 and 34, T3N , R42E of the Mount Diablo Base and Meridian. Each claim within the property boundary was identified at time of staking by 2in by 2in by 4ft wood posts marked with a scribed aluminum tag. The claims have not been surveyed by a mineral land surveyor, but they are registered and recorded with the U.S. Bureau of Land Management ("BLM"), Esmeralda and Nye Counties.

The Hasbrouck Mine (Figure 4-2) is covered by 28 patented and 532 unpatented lode mining claims occupying an area of approximately 9,390 acres (Appendix A). The claims are in a contiguous block that is located in Sections 1, 2, 3, 4, 5, 9, 10, 11, 12,13,14, 15,16, 23, 24, and 26, T1N, R42E, Sections 6, 7, 18, 19 and 20, T1N, R43E, and Sections 16, 17, 20, 21, 22, 23, 27, 28, 29, 32, 33, 34, and 35, T2N, R42E of the Mount Diablo Base and Meridian. Each claim within the property boundary was identified at time of staking by 2 by 2in by 4ft wood posts marked with a scribed aluminum tag. The claims have not been surveyed by a mineral land surveyor, but they are registered and recorded with the BLM, Esmeralda and Nye Counties.

Hill of Gold (Figure 4-2) is covered by 25 unpatented lode mining claims (Appendix A) occupying an area of 442 acres in Sections 15, 16, 21, and 22 of T2N, R42E of the Mount Diablo Base and Meridian. Each claim within the property boundary was identified at time of staking by 2in by 2in by 4ft wood posts marked with a scribed aluminum tag. The claims have not been surveyed by a mineral land surveyor, but they are registered and recorded with the U.S. Bureau of Land Management ("BLM"), Esmeralda and Nye Counties.

Current holding costs for unpatented mining claims are $165 maintenance fee per claim, each year to the BLM, and $12.00 Intent to Hold fee per claim, each year to Esmeralda County. WVM has provided documentation that all federal fees to maintain the claims for another year have been paid through September 2023. County fees and taxes for both the patented and unpatented claims have been paid in full to Esmeralda and Nye Counties through November 1, 2023.

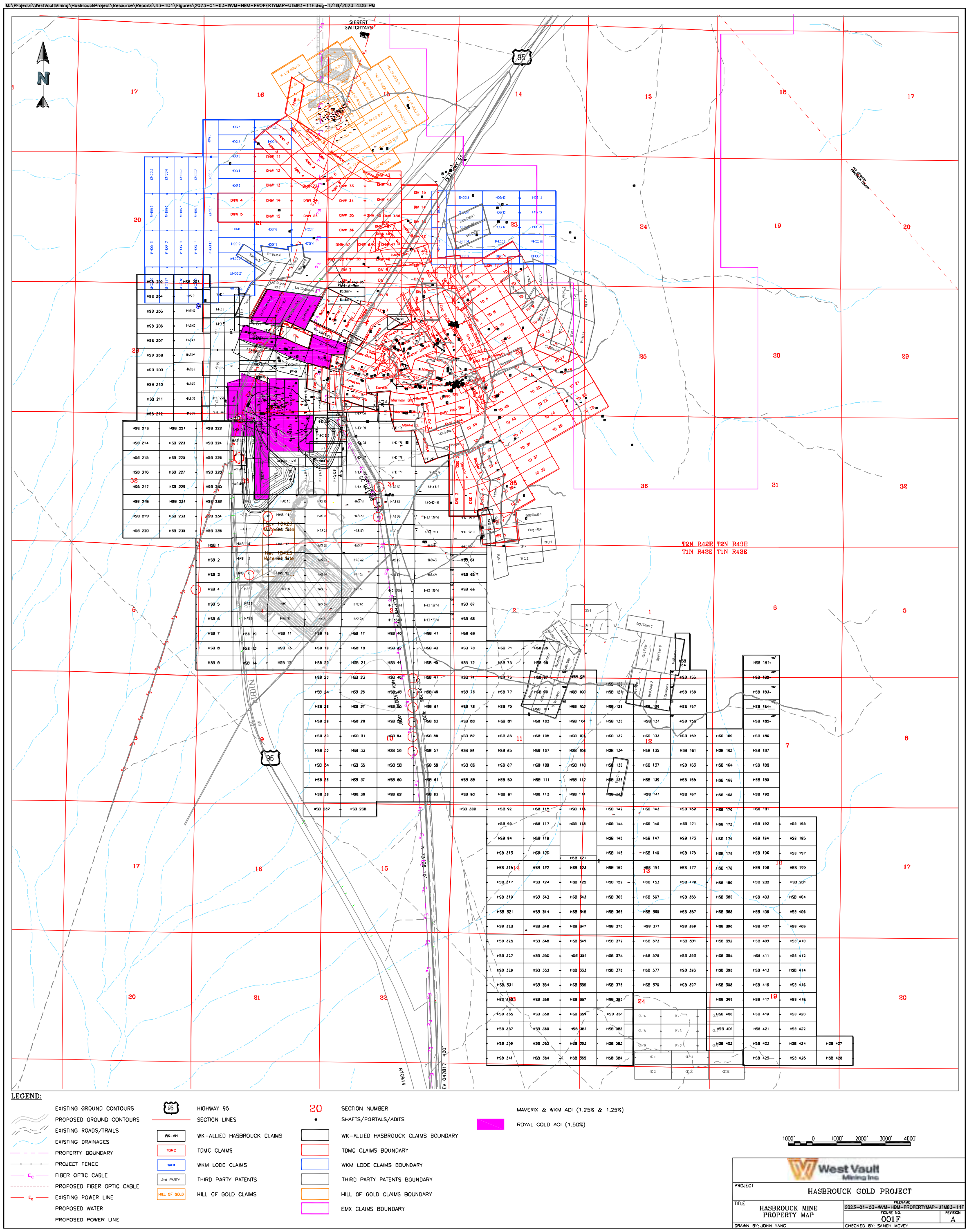

Figure 4-2. Land Status Map of the Hasbrouck Project Claims

4.3 AGREEMENTS AND ENCUMBRANCES

WVM's subsidiary WK Mining (USA) Ltd. ("WK") finalized and executed a Purchase and Sale Agreement (the "PSA") with Allied to acquire a 75% interest in the Three Hills and Hasbrouck mines in 2014. WK paid both the deposit and initial payment with total consideration having been paid to Allied of $20,000,000. Title to the properties was transferred to WK in 2014.

On September 11, 2014, WK entered into a mining lease to purchase agreement with Eastfield, covering seven patented mining claims at Three Hills Mine that became part of the property. Total consideration to be paid over the life of the lease is CDN$280,000, of which CDN$155,000 has been paid. On January 24, 2017, WK purchased from Eastfield the seven patented claims for the agreed price.

On June 19, 2015, Allied announced that the United States Bankruptcy Court for the District of Delaware had approved the sale of Allied's exploration properties and certain related assets (excluding the Hycroft operation) to Clover Nevada, a wholly-owned subsidiary of Waterton Precious Metals Fund II Cayman, LP ("Waterton"), which included the 25% interest in the Hasbrouck Mine.

WK had the option of making an additional $10,000,000 payment (the "Final Payment") on or before October 22, 2016 (the "Final Payment Deadline") to secure the 25% interest in the Hasbrouck Project that had been held by Allied and later held by Waterton. The properties were transferred into WK Allied Hasbrouck, LLC with a date of recordation in Nye County of September 9, 2016 and a date of recordation in Esmeralda County of September 12, 2016, with WK retaining a 75% interest in the LLC and Waterton retaining 25% interest in the LLC. Upon entering the LLC both parties were responsible for their share of the costs on a pro rata basis with Waterton's share of the costs accruing and payable in the full 30 months after the signing of the PSA.

WVM consolidated the Hasbrouck Project by purchasing the 25% stake held by Waterton in July 2020. WVM completed this purchase by paying US $10.0 million plus one million WVM common shares to Waterton in August 2020, and Waterton accepted the payment in accordance with the terms and conditions of the agreement. WVM consequently owns a 100% interest in the Hasbrouck Project from that time. Waterton's remaining rights and claims on the project and on WVM that formed a part of the PSA expired on February 2022. WVM has no work commitments, but the project is subject to certain underlying royalties as described below.

The Hasbrouck Project patented and unpatented claims are also subject to a purchase agreement between Vista Nevada and Newmont Capital Limited ("Newmont"), which was executed on May 23, 2003. This agreement covers both the Three Hills and Hasbrouck mines. Terms of the purchase agreement included a $50,000 cash payment on signing (completed), $200,000 or the equivalent in Vista Gold shares one year after signing (completed), and $500,000 upon commencement of commercial production on the property. An additional payment of $500,000 shall accrue if the average gold price over any three-month period of commercial production exceeds $400/oz.

Newmont held a one-time election to enter into a joint venture on the property. During 2010, Allied achieved the threshold trigger and Newmont elected not to enter into a joint venture and retained an NSR royalty of 2% on the Hasbrouck Mine.

For the Three Hills Mine, all claims are subject to a mineral production royalty of 1.25% (Triple Flag Metals Corp.) and a precious metal stream of effectively 1.13% (Sprott Private Resources Streaming and Royalty (B) Corp).

At the Hasbrouck Mine, all claims are subject to a 1.25% NSR Royalty (Triple Flag Metals Corp.) and a precious metal stream of effectively 1.13% (Sprott Private Resources Streaming and Royalty (B) Corp), while an additional further 1.5% NSR royalty is applicable to 17 of the patented claims and 2 of the unpatented claims (RG Royalties Inc.).

WVM has two Water Right Lease Agreements, each of which entitles WVM to pump ground water for the project at no cost per unit of water, The first Lease Agreement was entered into with Pathfinder Minerals in 2014 for 1,000 acre-feet annually (AFA), and expires in 2027. The second Lease Agreement was entered into with Manhattan Gulch Partners LLC in 2023 for 614 AFA and expires in 2051.

4.4 ENVIRONMENTAL CONSIDERATIONS

Rich DeLong of WestLand Engineering & Environmental Services Inc., an environmental permitting and government relations consultancy, provided the following information on environmental liabilities and permitting in a project communication document dated December, 29 of 2022. WVM's U.S. subsidiary, WK, conducted the most recent exploration at Three Hills Mine and Hasbrouck Mine, and environmental permits were in WK's name.

4.4.1 ENVIRONMENTAL LIABILITIES

Current environmental liabilities at the Three Hills and Hasbrouck mines are limited to exploration drill roads and pads. Current bonding is in place to support this work, associated with multiple Notices authorized by the BLM for less than 5 acres of disturbance each. Existing disturbances and bond amounts for each Notice are shown in Table 4-1. Other than reclamation obligations, which consist of re-contouring and re-vegetating exploration drill roads and sites, there are no known environmental liabilities associated with the exploration activities conducted at the Three Hills and Hasbrouck mines by Allied and WVM.

Table 4-1 Existing Disturbance and BLM Notices for the Hasbrouck Project

Notice #	Disturbance Acreage	Bond Amount
NVN-91216	4.88	$65,450.00
NVN-89964	1.84	$14,033.00
NVN-89750	4.53	$18,758.00

The Tonopah district is the center of extensive mining and exploration activity that has occurred over the past 110 years. Old workings and prospects are located throughout the Hasbrouck Mine , Three Hills Mine and Hill of Gold areas. Contamination may occur in association with historical surface and underground workings, or from former operators in relation to drill pads and sumps where chemicals or oils may have collected.

4.4.2 PERMITS REQUIRED

Three Hills Mine has acquired a federal permit and all key state permits, with the last state air quality permit having been issued in June, 2016. Certain minor permits are still required, but obtaining them is routine and without risk, and has been deferred to when a decision to construct the Three Hills Mine is made.

Permitting for the Hasbrouck Mine commenced in 2011 when a cultural survey was performed. Biology base-line studies were performed in subsequent years. Hasbrouck Mine currently has an issued federal permit and state reclamation permit. Work on permitting the Hasbrouck Mine is ongoing. A Plan of Operation for Hasbrouck Mine was submitted to the BLM in September 2017.

The review and approval process for the Hasbrouck Mine Plan of Operation ("MPO") by the BLM constitutes a federal action under the National Environmental Policy Act ("NEPA") and BLM regulations. Thus, for the BLM to process the Plan application, the BLM is required to comply with NEPA and prepare either an Environmental Assessment ("EA"), or an Environmental Impact Statement ("EIS"). The BLM determined that an EA was required for this project. In October of 2020 the BLM completed the EA and then approved the project. At the same time the BMRR approved the Nevada Reclamation Permit for the Project. No other federal, state, or county permits or authorizations have been sought or obtained for the Hasbrouck Mine.

The county, state, and federal permits required prior to commencement of mining operations for both the Three Hills and Hasbrouck mines are shown in Table 4-2. These permits are yet to be obtained.

Table 4-2. Operating Permits Required

Permit	Issuing Agency
Plan of Operations	Bureau of Land Management
Rights-of-Way	Bureau of Land Management
Reclamation Permit	NDEP Bureau of Regulation and Reclamation
Air Quality Operating Permit	NDEP Bureau of Air Pollution Control
Mercury Air Operating Permit	NDEP Bureau of Air Pollution Control
Water Pollution Control Permit	NDEP Bureau of Regulation and Reclamation
Artificial Pond Permit	Nevada Department of Wildlife
Dam Safety Permit	Nevada Division of Water Resources
Hazardous Material Storage Permit	Nevada State Fire Marshal
County Road Maintenance Agreement	Esmeralda and Nye Counties

4.5 EASEMENTS FOR LOCAL INFRASTRUCTURE

At the Hasbrouck Mine, both U.S. Highway 95 and the former U.S. Highway 95 have Right of Way boundaries and are immediately adjacent to the Mine. WVM has ascertained after consulting with Nevada Department of Transportation that mining in proximity to Highway 95 is viable and that relocating U.S. Highway 95 in order to exploit the Hasbrouck Mine is not required. Blasting will at times be subject to the requirements and constraints of the Nevada Department of Transportation, which include halting traffic flows for up to 20 minutes periodically.

At Hasbrouck Mine, a north-south buried fiber optic cable, owned by AT&T Inc., runs along the eastern boundary of the mine, just to the west of, and approximately parallel to, the old U.S. Highway 95. After consulting with AT&T Inc., WVM has determined that relocation of the buried cable will not be necessary.

At the Three Hills Mine another section of the same buried fiber optic cable runs north-south through the eastern portion of the Three Hills Mine and will require relocation for mining to take place. AT&T has provided the opinion that it is practical to relocate the fiber optic cable, AT&T is prepared to re-align the cable at WVM's request, and has provided a current scope-of-work, cost, and schedule for this.

5.0 ACCESSIBILITY, PHYSIOGRAPHY, CLIMATE, LOCAL RESOURCES, AND INFRASTRUCTURE

The information in this section has been modified from Wilson (2014), Tietz et al. (2015) and Dyer et al. (2016).

5.1 ACCESS

The Hasbrouck Mine is six miles south of Tonopah, Nevada, and will be accessed by a turn-out off U.S. Highway 95, an all-weather, all-season roadway suitable for commercial semi-trailer traffic. U.S. Highway 95 is the main north–south transportation corridor through central Nevada and passes 2.25 miles east of the Three Hills Mine, and immediately to the west of the Hasbrouck Mine. U.S. Highway 6 passes 1.25 miles north of the Three Hills Mine and is a major east-west transportation corridor through central Nevada. Both highways pass through Tonopah, Nevada.

The Three Hills Mine is one mile southwest of Tonopah and is accessed via county-maintained roads from the west end of Tonopah (Paymaster Canyon Road) and on an unnamed county-maintained road from the south. The Three Hills Mine is approximately five miles north of the Hasbrouck Mine.

Access to the Hill of Gold portion of the property is via U.S. Highway 95 approximately three miles south of Tonopah, then one mile west on a dirt road. Dirt roads in varying degrees of upkeep connect Hill of Gold with the Three Hills Mine to the north and are adopted and maintained by Esmeralda County.

5.2 PHYSIOGRAPHY

Elevations of the property vary between 5,600ft and 6,300ft AMSL. The principal physiographic features of the Hasbrouck Mine, Hill of Gold, and Three Hills Mine areas are prominent hills that rise 200-700ft off the valley floor. This includes Hasbrouck Mountain, the core of the Hasbrouck Mine, which rises 700ft from the valley plain to a peak of 6,300ft. The principal physiographic features of the Three Hills area are the cluster of hills known as "Three Hills", which rise 200ft from the valley floor to an elevation of about 6,100ft. Hill of Gold is located beneath a small hill extending above a large alluvial plain; the hill reaches a maximum elevation of 5870ft and is about 800ft to 1000ft across at the base. There is a decline and glory hole on the north side of the hill along with several small adits and prospect pits.

Vegetation in the area is typical of south-central Nevada and consists of sagebrush and other desert plants on the lower slopes and valleys. Trees are absent. Shadscale, white sage, and greasewood occur with sagebrush on the drier slopes and hills.

5.3 CLIMATE

The climate at the Hasbrouck property area is semi-arid, with temperatures that are from cool to cold during the winter, with occasional moderate snowfalls, and warm during the summer with cool nights. The area is fairly dry, with infrequent rains during the summer. Exploration and mining activities can be conducted year-round.

5.4 LOCAL RESOURCES AND INFRATRUCTURE

5.4.1 HUMAN RESOURCES, ACCOMMODATION, AND AMENITIES

The towns of Tonopah (population ~2,200) and Goldfield (population ~250) are within easy driving distance of the properties and have basic amenities, medical services, housing, apartments, commercial and office space for rent and for sale, and lots for sale. The residents of these two communities comprise an experienced work force with historical and recent ties to mining operations in Nevada. Taken together, these locations can provide living areas for employees and it is expected that residents of Tonopah and Goldfield will form a significant portion of the workforce.

5.4.1.1 ELECTRICAL POWER

Electrical power for Three Hills Mine will be from a rented 1.5 MW LNG-powered generating unit. An alternative source of electrical power is by tapping into an existing 120kV power line, owned by NV Energy, a state-wide energy provider and the sole option for grid power for the project, which runs east-west approximately a mile north of the Three Hills property line. This option has not been chosen for the project due to the short life-of-mine at Three Hills Mine of two years, and to avoid having NV Energy's connection to grid power be on the critical path for the Three Hills Mine construction schedule.

At Hasbrouck Mine, grid power will be accessed from an existing NV Energy 120 kV power line that runs east-west about 2 miles north of the mine. NV Energy has designed a switching station (the "Siebert Switching Station") at this location along with five miles of new 120kV line to intersect the west side of the Hasbrouck Mine.

All rights-of-way permits are in hand for grid power connections.

5.4.1.2 RAW WATER SUPPLY

Raw water is defined as water, other than potable water, that will be required and be used by the Project. It includes water for construction purposes, make-up water for mineral processing, water for dust control on mine roads, and any other sundry uses. The quantity of water required is estimated at between 350 and 900 gpm.

The primary source of raw water for the Hasbrouck Project is from two wells to be installed close to Three Hills Mine. WVM has obtained two water right lease agreements; one lease agreement concludes in 2027 (Permits 90479 and 90480), which is why a second water right lease agreement was entered into (Permit 53101). Either water right lease agreement would provide sufficient water for the full project, and both are in good standing. Raw water will be delivered using piping from the Three Hills Mine water wells to the Hasbrouck Mine. Because Three Hills Mine and Hasbrouck Mine are in different hydrographic basins, approval was sought and received from the Nevada state engineer for the inter-basin transfer of water from one basin to another in January, 2019.

As an alternative, raw water is also available from the Tonopah Public Utility ("TPU"), which has offered to sell water to the project. TPU has the necessary water permits and infrastructure in the form of wells, pumps, pipelines and tanks to meet the project's needs, although certain additional pipes, pumps, and tanks would be required. Because their water is defined as municipal water, Tonopah has the legal right to sell it to anyone and for any use without requiring permissions or permits from the state.

5.4.1.3 POTABLE WATER SUPPLY

Potable water for Three Hills Mine will be sourced from Tonopah Public Utility as the intention is to locate administration and the assay laboratory in Tonopah. Potable water for Hasbrouck Mine will be sourced from the raw water delivered to the Hasbrouck Mine via pipeline from Three Hills Mine. A certified water supply system will be required in this case.

5.4.2 MINING INFRASTUCTURE

Both the Three Hills and Hasbrouck mines have adequate space to develop infrastructure for mine operations. This includes sitting of the heap-leach facilities, waste rock storage areas, process buildings, workshops, etc.

6.0 HISTORY

This section describes exploration at Three Hills Mine and Hasbrouck prior to acquisition by WVM and is largely taken from Wilson (2014), as presented in Dyer et al. (2016).

6.1 EXPLORATION HISTORY

6.1.1 HASBROUCK EXPLORATION HISTORY

Silver and gold mineralization was first discovered on Hasbrouck Mountain in 1902. Early mining exploited the Kernick vein, which was worked on a small scale through the mid-1920s. The only recorded production from Hasbrouck is 740 tons of ore by the Tonopah Hasbrouck Mining Company in 1923 and 1924 (Couch and Carpenter, 1943) that grossed $10,406. The early miners completed about 6,500ft of adits and 1,000ft of raises.

In 1974, Cordex completed detailed surface and road cut sampling, vertical conventional rotary drilling, geologic mapping, sampling of surface and underground workings, a Mineral Resource Estimate, and metallurgical test work. The claims were relinquished at the end of 1975, but subsequently re-acquired in 1980. During the 1980 work program, Cordex undertook detailed underground sampling of the principal workings, including the Ore Car, Main, South, and Northeast adits. A total of 191 underground samples were collected over a total length of 3,862ft of adit. One surface and two underground bulk samples were collected for metallurgical test work. In total, drilling by Cordex from 1974–1980 comprised 25 rotary drill holes (9,760ft) and one of the 1974 rotary drill holes was deepened using core drilling (959ft of core). A large, low-grade gold–silver deposit was outlined based on these activities. The current Mineral Resource database excludes three of the Cordex drill holes due to uncertain collar locations.

Geological mapping of the Hasbrouck Mine area was undertaken as part of a Master's degree thesis research (Graney, 1985). The mapping defined multiple structural orientations and a number of breccia bodies believed to represent the controlling features of precious metal mineralization, primarily the east–west-trending Kernick vein zone.

Franco-Nevada optioned the property from Cordex in 1985, drilled 30 vertical reverse-circulation ("RC") drill holes (10,145ft), and completed metallurgical test work. Mineral Resource and "mineable reserve" estimates (not in accordance with NI 43-101) were estimated in 1986. The Franco-Nevada drilling succeeded in expanding and better defining the Hasbrouck Mine.

FMC optioned the property in 1988 and drilled 76 RC angle and vertical drill holes (34,255ft) and undertook additional metallurgical test work. The FMC program consisted primarily of definition and infill drilling, including a small zone of tightly-spaced shallow drilling on a 15ft x 25ft grid. Mineral Resource and "mineable reserve" estimations (not in accordance with NI 43-101) were performed in 1988. FMC also completed an E-Scan geophysical survey over a portion of the deposit, and drilled two deep RC drill holes to test a geophysical anomaly which had been interpreted as a possible high-grade feeder zone to the known mineralization. No such zone was intersected in the drilling. Four of the RC drill holes (1,160ft) were sited on the Silver King claim, north of Hasbrouck Mountain, but no anomalous gold or silver values were returned.

Following FMC's relinquishment of their interest in the property in 1990, Euro-Nevada completed a 19 line-kilometer CSAMT geophysical survey and reconnaissance surface rock chip surveys to the north, east, and southeast of Hasbrouck. A number of geochemical and geophysical targets that were considered prospective for gold mineralization were developed from this work.

Corona optioned the property from Euro-Nevada in 1992 and drilled two RC drill holes (1,210ft) to the north of Hasbrouck Mountain, in the area of the Eliza Jane patented claim. The drill holes intersected broad zones of anomalous gold, silver and molybdenum mineralization. Corona also updated the "mineable reserve" (not in accordance with NI 43-101) estimate for the Hasbrouck Mine.

Homestake acquired Corona in 1993 and vended their interest in the Hasbrouck Mine to Prime Equities International Corporation ("Prime") in the same year. Based on the information currently available to WVM, neither Homestake nor Prime completed any substantive work on the project.

Euro-Nevada regained 100% interest in the property in 1993 and further refined the target exploration concepts that had been developed in 1990 and 1991. In 1996, Euro-Nevada completed an 18 hole RC drilling program (17,670ft) that tested these targets, which were aligned in a northwest-trending belt that passed to the north, east and southeast of Hasbrouck Mountain. Targets were identified by geophysical or geochemical anomalies, the presence of favorable alteration, structures and structural intersections, and favorable stratigraphy. The drilling failed to identify any new zones of significant gold or silver mineralization, but anomalous gold–silver values were encountered, typically over restricted down hole widths. The best results were returned from drilling in the area of the Eliza Jane patented claim.

Newmont took control of the Hasbrouck Mine by way of their merger with Euro-Nevada in 2002. Newmont then vended the property to Vista Gold on May 23, 2003. Allied Nevada assumed control of the property when Allied Nevada was floated as a spin-off company from Vista in 2007.

From 2010 to 2013, work completed by Allied included surface mapping, systematic geochemical sampling, several drill campaigns, Data Verification, metallurgical studies, a CSAMT geophysical program, regional gravity survey, and reinterpretation of the spatial geology, and completion of a Preliminary Economic Assessment which is no longer relevant due to obsolescence of input costs and subsequent drilling.

Data collected prior to Allied's interest, including drill hole and surface sample data, have been located in various grids, including truncated State Plane, and UTM NAD27 Zone 11. Allied converted these data to UTM NAD83 Zone 11 using Corpscon6. Elevation data have been based on the NGVD29 vertical datum. Field data collected by Allied utilized the UTM NAD83 Zone 11 coordinate grid system.

The greater Hasbrouck Mine was re-mapped at a scale of 1:6,000 by Allied personnel in 2011. Re-mapping by Allied personnel led to a re-interpretation of the structural framework and the relationship of various structural orientations to mineralization. In general, the stratigraphic interpretations have been retained from the previous mapping.

Selected road-cuts were systematically channel sampled by Allied on 10-ft nominal lengths with the goal of identifying structural patterns to mineralization. A total of 677 samples were collected by Allied and submitted to ALS Chemex in Reno, Nevada for precious metal and multi-element analysis. Numerous zones of outcropping mineralization were identified. Multiple structural zones were also highlighted as either mineralized, or as boundaries to mineralization.

Two geophysical surveys were undertaken by predecessors of Allied. These data were not available to WVM.

An E-SCAN (multi-directional resistivity) survey was completed over Hasbrouck Mountain in 1988 and reinterpreted in 1998. The scan shows a resistive cap at the top and at the Saddle Knob, as well as generally matching a mapped silicified northwest structural trend on the south side. A northwest linear on the north slope at Hasbrouck is also suggested by the survey. Resistive near-vertical zones were noted in the report that crudely match similar resistive zones defined in a later CSAMT survey by Allied (see below). The reprocessed color plan view files were found to generally match the near surface resistivity detailed in the later CSAMT. The 1988 E-Scan survey lacked the detail of Allied's later CSAMT.

A CSAMT survey for the areas north and south of Hasbrouck Mountain was completed in 1990. Except for a line run at the southern base of Hasbrouck Mountain (Wright, 2011a), the 1990 survey does not cover the main project. The southern line suggests a continuation to the south of a mapped fault (East Fault) under cover.

Allied completed a CSAMT survey in 2011 over Hasbrouck Mountain consisting of 11.5 line kilometers at 100 meter station spacing (Wright, 2011b). The survey identified a strong resistor in the Fraction Tuff on the eastern portion of the mountain. Drill intercepts confirm that the anomaly is likely a locally welded portion of the Fraction Tuff. The strong silicification in the Upper Siebert units on Hasbrouck Mountain was outlined, and possible feeder faults are evident in the CSAMT images. The Saddle Fault Zone and the East Fault show as 'breaks' between resistive masses. The images match the mapped resistive northwest trending zones on the south and northern part of Hasbrouck. Drill testing of the upper portion of these zones confirmed the CSAMT resistivity model.

In 2010, Allied completed two gravity surveys: one over Hasbrouck proper, and a contiguous survey to the south of the Hasbrouck Mountain (Wright, 2010). Subsequently, a gravity survey was completed over the southern portion of the Hasbrouck claim block, with 729 new gravity data stations added contiguous to the 2010 gravity surveys (Wright, 2011a). This 2011 survey was combined with the previous surveys into a master gravity plot, and structural interpretations derived from the surveys were incorporated into the exploration and mapping efforts.

Regional gravity patterns indicate a strong northwest lineament, overprinted by north-south and northeast linears. This gravity signature has been interpreted as evidence of the Walker Lane shear zone, along with transverse faults. Hasbrouck Mountain lies on the northern edge of a major gravity linear (Wright, 2010, 2011a).

Drilling by Allied from 2010 through 2012 included 128 RC holes (117,093ft) and 43 diamond-core holes (28,606ft). Most of the drilling was focused on Mineral Resource definition and expansion, but also included significant core drilling to provide material for metallurgical test work. The 2012 drilling was located at the Silver King and Mastif targets, both of which are external to the Hasbrouck Mine Mineral Resource.

The authors have no information on exploration, if any, conducted in 2013. WVM acquired the Hasbrouck portion of the property in 2014. Drilling by WVM from 2014 through 2018 include 15 RC holes (4820 ft); all drilling was done to the south, southeast, north and northeast of the current Mineral Resources for condemnation and to discover mineralization that may extend beyond the current Hasbrouck Mine Mineral Resource.

6.1.2 THREE HILLS EXPLORATION HISTORY

Modern exploration in the Three Hills area started in 1974 when Cordex obtained the property and completed sampling and mapping in the project area. Cordex drilled 14 rotary holes in 1978, intersecting gold mineralization in most of the holes. Saga Exploration leased the property and, between 1983 and 1988, completed 33 air track and 28 RC drill holes. Two of the air track holes and five of the RC holes drilled by Saga are not included in the current database. Echo Bay leased the property in 1988 and completed an additional 77 reverse circulation drill holes during the next two years. During the period 1991 to 1995, Gexa Gold and Coeur D'Alene Mines completed sampling and metallurgical studies on the property and Gexa drilled two short diamond-core holes.

In 1995, Eastfield Resources Ltd. and Prism Resources Inc. partnership ("Eastfield-Prism") optioned the property from Coeur D'Alene Mines, who had acquired the property by way of settlement of receivership of Gexa Resources, and completed additional drilling and testing on the property between 1995 and 1997. A number of geophysical studies (including magnetics and induced polarization) were completed, as well as geochemical sampling over a regular grid. A total of 19 soil lines, spaced 300-400ft apart were completed. Eastfield's induced polarization ("IP") survey was made over an area north of Three Hills Mine, with 12.3-line miles completed. Oxidation levels in the area are of sufficient depth to make it difficult to detect sulfide mineralization. No strong features were recognized. The Eastfield magnetic data has been useful in defining linear fault features and major lithology breaks.

A Master's thesis research project was completed by R. Thompson during the 1996 and 1997 exploration seasons at Three Hills. The thesis work included study of thin sections, whole rock geochemistry, and x-ray diffraction studies of the alteration mineralogy (Tregaskis and Garratt, 1998). Additionally, some samples were analyzed for gold, silver, arsenic, antimony, mercury, molybdenum, and occasionally copper, lead, and zinc. Arsenic, antimony, molybdenum, and mercury concentrations are elevated in the limonitic Siebert Formation over a widespread area in the northern portion of Three Hills area.

Geologic mapping at Three Hills was completed by R. Thompson and S. Tregaskis (1997-1998). This mapping remains as the guide for exploration in the area.

Coeur D'Alene Mines sold Three Hills property to Euro-Nevada, which subsequently merged with Newmont. Eastfield terminated their option agreement and returned the property to Newmont after the year 2000 exploration season.

On May 23, 2003, Vista executed a purchase agreement with Newmont Capital, which included both the Hasbrouck and Three Hills properties. Vista did not conduct exploration at Three Hills until the spin-off of Allied Nevada Gold Corp.

Allied initiated exploration at Three Hills in 2012 and drilled 17 RC holes that year, focused on expanding known mineralization. The best hole was TH12R-015, which returned 66m of 3.33 g/t Au. An additional eight core holes were drilled for metallurgical samples and condemnation in 2013.

Allied identified a total of 312 rock-chip samples taken in the Three Hills area during exploration between 1974 and 2012. The bulk of the samples are channel samples taken from three road cuts and a 225ft adit. Allied was able to spatially locate and validate assay data for 204 of these samples. Rock-chip samples range from < 0.005 to 5.69ppm Au and <0.20 to >100ppm Ag. Approximately 70% of the samples were also analyzed for geochemistry, including Ba, Hg, Mn, As, Mo, and Sb. The Eastfield soil data were not located by Allied.

The authors have no information on exploration, if any, conducted in 2013. WVM acquired the Three Hills portion of the property in 2014. Drilling by WVM in 2014 include 11 RC holes (7200ft), drilled to expand the eastern and down-dip portions of Three Hills gold mine, and 3 core holes (1877ft) for geotechnical studies.

6.1.3 HILL OF GOLD EXPLORATION HISTORY

According to Prenn (2003) citing Tragaskis and Garratt (1996), gold was discovered at Hill of Gold in 1919. There is a decline and glory hole on the north side of the hill along with several small adits and prospect pits, but the authors have no information on when these workings were developed. The volume of the workings is unknown although the depth of the decline has been estimated to exceed 100ft (Hardy and Ristorcelli, 1996).

Modern-era exploration at Hill of Gold commenced between 1974 and 1985 when Cordex and Crown Resources drilled an estimated total of 67 holes. Phelps Dodge drilled 16 holes in 1988.

Eastfield conducted exploration at Hill of Gold in the mid-1990s that included seven surface trenches excavated in 1996. There are records for 83 RC and six core holes (Hardy and Ristorcelli, 1996) but only the core holes and 13 of the RC holes were drilled by Eastfield in 1996. The authors have no information on when or by whom the other 70 RC holes were drilled.

The authors have no information regarding when Eastfield's exploration and ownership of the Hill of Gold area was terminated, or any ownership or activity from then until December 2020 when WVM acquired the ground from Mr. Robert Bottom. The authors are unaware of other exploration work, if any, carried out by these historical operators.

6.2 HISTORICAL ESTIMATES

This section has been largely summarized and modified from Dyer et al. (2016) based on Wilson (2014), who noted that the Historical Estimates provide perspective regarding the range of estimates produced using different data, methods, and assumptions. These Historical Estimates are superseded by the current Mineral Resource Estimates described in Section 14.0 and are not to be relied on.

6.2.1 HISTORICAL THREE HILLS ESTIMATES

Historical Estimates for Three Hills Mine, commissioned by Echo Bay, GEXA Gold and Eastfield, in 1988 through 1996, were summarized by Prenn (2006) and are presented in Table 6-1. These Historical Estimates were prepared prior to the implementation of NI 43-101, are relevant only for historical completeness.

Table 6-1. Three Hills Historical Estimates: 1988 through 1996
(from Prenn, 2006)

Company	Method	Year	Cut-off oz Au/ton	K Tons	Grade oz Au/ton	K oz Au
Echo Bay	Section	1988	0.01	2,051.9	0.027	55.4
			0.02	1,271.8	0.035	44.5
Echo Bay	Section	1988	0.01	7,357.0	0.026	191.0
			0.02	3,526.0	0.036	127.0
Echo Bay	Polygon	1988	0.01	6,700.0	0.023	155.0
			0.02	2,750.0	0.039	107.0
Echo Bay	Section	1990	0.01	6,450.0	0.026	167.7

Company	Method	Year	Cut-off oz Au/ton	K Tons	Grade oz Au/ton	K oz Au
			0.02	3,180.0	0.036	114.5
Gexa	ID3	1991	0.01	4,203.4	0.021	88.3
			0.02	1,894.3	0.029	54.9
Eastfield	ID3	1996	0.01	6,286.0	0.023	144.6

The 1988 through 1996 Historical Estimates used categories other than those required under NI 43-101, but Mr. Bickel is not aware of the differences or the work that needs to be done to upgrade or verify these Historical Estimates as current Mineral Resources or Mineral Reserves and a Qualified Person has not done sufficient work to classify the Historical Estimates as current Mineral Resources or Mineral Reserves. WVM is not treating the Historical Estimates as current Mineral Resources or Mineral Reserves. More recent estimates are provided below, and all are superseded by the current Mineral Resources and Mineral Reserves presented in Sections 14 and 15 of this report.

Prenn (2006) updated the 1996 Historical Estimate as presented in Table 6-2 using a bulk density of 15.0ft^3/ton, based on an average of 19 drill core samples from the 1996 Eastfield drilling.

Table 6-2. Three Hills Historical Estimates 2003 and 2006
(Prenn, 2006)

	Indicated			Inferred		
Cutoff oz Au/ton	K Tons	oz Au/ton	K oz Au	K Tons	oz Au/ton	K oz Au
0.000	5,744.0	0.023	133.8	1855.0	0.001	1.3
0.010	5,736.0	0.023	133.6	10.6	0.015	.2
0.015	4,754.0	0.025	120.2	1.4	0.34	0.0
0.020	3,180.0	0.030	96.6			
0.030	1,132.0	0.041	46.5			

The use of multiple cut-off grades is not in accordance with NI 43-101 and Mr. Bickel is not aware of the work that needs to be done to upgrade or verify these Historical Estimates as current Mineral Resources or Mineral Reserves. A Qualified Person has not done sufficient work to classify the Historical Estimates as current Mineral Resources or Mineral Reserves. WVM is not treating the Historical Estimates as current Mineral Resources or Mineral Reserves. More recent estimates are provided below, and all are superseded by the current Mineral Resources and Mineral Reserves presented in Sections 14 and 15 of this report.

The most recent Historical Estimate of Mineral Resources at Three Hills was presented in the Technical Report by Dyer et al (2016). Table 6-3 summarizes the 2016 Mineral Resource Estimate at Three Hills.

Table 6-3. Summary of 2014 Historical Estimate, Three Hills
(0.005 opt Au cut-off; from Dyer et al, 2016)

Category	Tons (000's)	Gold opt	Gold (000 oz)
Indicated	10,897	0.017	189
Inferred	2,568	0.013	32

6.2.2 HISTORICAL HASBROUCK ESTIMATES

Historical Estimates for the Hasbrouck Mine performed prior to 2003 by various operators were summarized by Prenn and Gustin (2003) and are presented in Table 6-4. They are relevant only for historical completeness. These Historical Estimates used categories other than those required under NI 43-101, but Mr. Bickel is not aware of the differences or the work that needs to be done to upgrade or verify these Historical Estimates as current Mineral Resources or Mineral Reserves, and a Qualified Person has not done sufficient work to classify the Historical Estimate as current Mineral Resources or Mineral Reserves. WVM is not treating the Historical Estimates as current Mineral Resources or Mineral Reserves. All Historical Estimates are superseded by the current Mineral Resources and reserves presented in Section 14 of this report. The following notes apply to some of the Historical Estimates:

1. The Cordex and FMC Historical Estimates were prepared in-house.
2. Bechtel, Inc. prepared the Historical Estimates for Franco-Nevada.

Table 6-4. Historical Estimates for the Hasbrouck Mine
(Prior to 2003 with 0.020 oz Au/ton cut-off)

Company	Category as reported	Year	Tons (x 10^6)	Grade (oz Au/ton)	Grade (oz Ag/ton)	oz Au	oz Ag
Cordex	"Geologic Reserve"	1975	5.0	0.040	0.7	200,000	3,500,000
Franco-Nevada	"Geologic Reserve"	1986	7.7	0.036	0.7	277,000	5,390,000
FMC	"Geologic Reserve"	1988	10.2	0.038	0.41	388,000	4,180,000
Franco-Nevada	"Mineable Reserves"	1986	3.16	0.038	0.61	120,000	1,930,000
FMC	"Mineable Reserves"	1988	1.90	0.045	0.50	85,000	950,000
Corona	"Mineable Inventory"	1989	4.2	0.036	n/a	151,000	

The author is unaware of any of the companies listed in Table 6-4 having undertaken density measurements on the mineralized rocks at Hasbrouck Mine. The only tonnage factor used that is known to RESPEC is 12 cubic feet per ton of ore, which was applied by Bechtel in the Franco-Nevada estimations and is likely a best-guess estimate. Mr. Bickel concludes that generalized, unsupported tonnage factors were probably used in the Historical Estimates.

The Franco-Nevada "Geologic Reserve" was defined by a block model with 20ft x 20ft x 20ft blocks that were estimated using 20-foot vertical composites of drill assays and geostatistical techniques. The "Mineable Reserves" includes those portions of the "Geologic Reserve" that were defined by drill holes with approximately 100-foot spacing and that were encompassed in a pit with 45º slopes (Bechtel, 1986). The pit appears to have been placed on a best-fit basis to include the highest grade composites; economic parameters do not appear to have been used to generate the pit.

No information regarding the parameters or methods used in the Cordex and Corona (Barnett, 1989) estimations was reviewed by the author. The Euro-Nevada "Mineable Reserves" were defined by drilling at approximately 100ft to 150ft spacing. The

FMC "Mineable Reserves" Historical Estimate used assumed prices of $450/oz gold and $6.50/oz silver, and recoveries of 49% for gold and 9% for silver. The author knows of no other parameters used in the "Mineable" Historical Estimates of Euro-Nevada, FMC and Corona.

Prenn and Gustin (2003) estimated the Hasbrouck gold and silver resources at the request of Vista Gold, conforming to the CIM standards and definitions of 2000. The 2003 estimate is shown in Table 6-5 An updated Technical Report and Historical Estimate for Vista was provided by Prenn and Gustin (2006), but no new technical data were available. The 2003 Historical Estimate remained unchanged in Prenn and Gustin (2006).

Table 6-5. 2003 and 2006 Historical Estimate for the Hasbrouck Mine

INDICATED RESOURCES					
		GOLD		SILVER	
Cut-off (oz Au/ton)	K Tons	Grade (oz Au/ton)	Ounces	Grade (oz Ag/ton)	Ounces
0.01	20,300	0.023	459,000	0.32	6,464,000
0.02	8,100	0.034	277,000	0.45	3,663,000
0.03	3,100	0.051	160,000	0.6	1,876,000
0.04	2,000	0.06	121,000	0.64	1,291,000
0.05	1,100	0.073	81,000	0.7	784,000
0.08	280	0.108	31,000	0.85	242,000
0.10	130	0.131	17,000	0.82	110,000
0.15	27	0.174	4,700	0.61	16,000
INFERRED RESOURCES					
		GOLD		SILVER	
Cut-off (oz Au/ton)	K Tons	Grade (oz Au/ton)	Ounces	Grade (oz Ag/ton)	Ounces
0.01	8,200	0.021	172,000	0.19	1,589,000
0.02	2,300	0.035	83,000	0.25	592,000
0.03	1,000	0.052	52,000	0.33	333,000
0.04	760	0.057	43,000	0.31	235,000
0.05	410	0.068	28,000	0.27	110,000
0.08	70	0.102	7,200	0.17	12,000
0.10	44	0.111	4,900	0.14	6,000
0.15	0	0	0	-	-

Allied prepared an up-dated Historical Estimate and Technical Report and Preliminary Economic Assessment ("PEA") in accordance with NI 43-101 utilizing a November 2011 database that incorporated drilling done by Allied in 2010 and 2011 (Flint et al., 2012). A bulk density of 2.4 tonnes per cubic meter was applied by Flint et al. (2012), apparently based on the five mineralized rock samples analyzed for bulk density in Prenn and Gustin (2006). The Allied 2012 Historical Estimate used ordinary kriging and gold-equivalent cut-off grades for the reporting of Inferred-only resources as summarized in Table 6-6.

Table 6-6. 2012 Hasbrouck Mine Inferred Resource Historical Estimate at Various Cut-off Grades
Flint et al. (January, 2012)

Cut-Off AuEq opt	Tons	Au Opt	Au oz	Ag opt	Ag oz	AuEq Opt	AuEq oz
0.005	128,608,197	0.009	1,157,474	0.228	29,322,669	0.013	1,671,907
0.006	111,187,572	0.010	1,111,876	0.247	27,463,330	0.015	1,667,814
0.007	96,298,939	0.011	1,059,288	0.264	25,422,920	0.016	1,540,783
0.008	83,597,819	0.012	1,003,174	0.283	23,658,183	0.017	1,421,163
0.009	73,192,760	0.013	951,506	0.300	21,957,828	0.019	1,390,662
0.010	64,634,418	0.014	904,882	0.316	20,424,476	0.020	1,292,688
0.011	57,391,006	0.015	860,865	0.331	18,996,423	0.021	1,205,211
0.012	51,208,442	0.016	819,335	0.346	17,718,121	0.022	1,126,586
0.013	45,762,953	0.017	777,970	0.361	16,520,426	0.023	1,052,548
0.014	40,832,277	0.018	734,981	0.376	15,352,936	0.024	979,975
0.015	36,819,290	0.019	699,567	0.391	14,396,342	0.025	920,482
0.016	33,357,756	0.019	633,797	0.406	13,543,249	0.026	867,302
0.017	29,793,687	0.020	595,874	0.421	12,543,142	0.028	834,223
0.018	26,958,523	0.021	566,129	0.436	11,753,916	0.029	781,797
0.019	24,368,890	0.022	536,116	0.452	11,014,738	0.030	731,067
0.020	22,213,157	0.023	510,903	0.466	10,351,331	0.031	688,608
0.025	12,940,980	0.027	349,406	0.551	7,130,480	0.037	478,816
0.030	7,939,904	0.032	254,077	0.632	5,018,019	0.043	341,416
0.035	4,835,234	0.037	178,904	0.715	3,457,192	0.050	241,762
0.040	2,917,621	0.044	128,375	0.812	2,369,108	0.058	169,222

The most recent resource Historical Estimate for the Hasbrouck Mine was published by Dyer et al (2016). A summary of the 2016 Historical Estimate is presented in Table 6-7.

Table 6-7. Summary of 2014 Hasbrouck Historical Estimate from Dyer et al (2016)
(Cut-off Grade = 0.006oz AuEq/ton; oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.000417))

Category	Tons (000tons)	Gold opt	Silver opt	Gold (000oz)	Silver (000oz)
Measured	8,261	0.017	0.357	143	2,949
Indicated	45,924	0.013	0.243	595	11,147
Measured & Indicated	54,185	0.014	0.260	738	14,096
Inferred	11,772	0.009	0.191	104	2,249

6.2.3 HISTORICAL HILL OF GOLD ESTIMATES

An Historical Estimate for Hill of Gold was presented by Hardy and Ristorcelli (1996) for Eastfield as summarized in Table 6-8. This Historical Estimate was prepared prior to the implementation of NI 43-101, is relevant only for historical completeness. There was no adjustment of the 1996 Historical Estimate to account for the unknown tonnage mined in the historical early workings mentioned in Section 6.1.3. It was assumed that the volume of material mined was not significant. Modeling was performed using Medsystem software with geologic interpretations provided by Eastfield. The assay database was composited to 10ft bench composites which were then coded with the appropriate zone number. A block model was constructed, and block grades were estimated using ordinary kriging. Blocks within specific zones were estimated using only the composites within that zone.

Table 6-8. Hill of Gold 1996 Historical Estimate
(from Hardy and Ristorcelli, 1996)

Company	Method	Year	Cut-off oz Au/ton	Tons 000's	Grade oz Au/ton	oz Au 000's
Eastfield	OK	1996	0.01	1,629.0	0.026	42.35

Mineralized zones were identified and drawn on sections oriented generally perpendicular to the major structures in the deposit. The structures trend at an azimuth of about 60° so the sections were drawn at an azimuth of 150°. The zones defined were essentially grade zones although their size, shape and location have been established, in part, by geologic interpretation. The cut-off for the zones was 0.010 oz Au/ton although it was lowered to values as low as 0.007 in some locations depending on geometry and grade continuity. These sections were then digitized and sliced to plan orientation on 10ft benches. Silver was not modeled.

The 1996 Historical Estimate used the Inferred classification for the gold resource and was later represented by Prenn (2006) in accordance with the CIM Definitions and NI 43-101. Mr. Bickel is not aware of the work that needs to be done to upgrade or verify these Historical Estimates as current Mineral Resources or Mineral Reserves and a Qualified Person has not done sufficient work to classify the Historical Estimate as current Mineral Resources or Mineral Reserves. WVM is not treating the Historical Estimates as current Mineral Resources or Mineral Reserves.

6.3 HISTORICAL PRODUCTION

Although mining took place prior to 1900 in the vicinity of Tonopah, most of the production from the project area took place between 1900 and 1920. Silver and gold mineralization was first discovered on Hasbrouck Mountain in 1902. Early mining exploited the Kernick vein, which was worked on a small scale through the mid-1920s. The recorded production from

Hasbrouck comprises 740 tons of ore produced by the Tonopah Hasbrouck Mining Company in 1923 and 1924 that grossed $10,406 (Couch and Carpenter, 1943). The early miners excavated about 6,500ft of adits and 1,000ft of raises.

No production figures are available for Three Hills Mine. Production from Three Hills Mine may have included minor amounts of gold mined from several adits and shafts in the area. The authors are not aware of any recorded production figures for Three Hills Mine.

Production from Hill of Gold included minor amounts of gold mined from several adits and shafts in the area, and prospect pits. The volume of the workings is unknown although the depth of the decline has been estimated to exceed 100ft. The authors are not aware of any recorded production figures for Hill of Gold.

7.0 GEOLOGIC SETTING, AND MINERALIZATION

This section has been taken from the Technical Reports of Prenn and Gustin (2006), Wilson (2014), Dyer et al. (2016) and sources therein.

7.1 GEOLOGIC SETTING

7.1.1 REGIONAL GEOLOGY

The Hasbrouck property is located in the western portions of the Tonopah and Divide mining districts, respectively, which are characterized by exposures of Tertiary volcanic and volcano-sedimentary rocks. The Divide district encompasses a probable caldera collapse and dome-field setting (Graney, 1985). Both Tonopah and the Divide districts lie along the east margin of the Walker Lane belt, a northwest-trending province in western Nevada and eastern California (Stewart, 1988) that includes numerous epithermal precious metal deposits, many of which are related to Tertiary volcanic rocks. Prominent northwest-trending strike-slip faults and related north-south to northeast trending normal faults characterize much of the Walker Lane belt.

The Tertiary volcanic rocks of the Divide district have been assigned to the Mizpah Formation, West End Rhyolite, Fraction Tuff, Siebert Formation, Divide Andesite and Oddie Rhyolite, all of Miocene age (Bonham and Garside, 1974; Bonham and Garside, 1979). The older West End and Mizpah formations have been drilled along the northeast of the Three Hills area, and are the principal hosts to mineralization at Tonopah. These units have not been encountered at depth under Three Hills or the Hasbrouck Mine. Overlying these is the Fraction Tuff, thought to have been derived from eruptions related to the collapse of an Early Miocene caldera centered on the area. Subsequent Basin-and-Range extensional faulting led to the deposition of fluvial and lacustrine sedimentary units of the Siebert Formation, which are intercalated with air-fall and thin ash-flow tuffs. Flows and domes of the Brougher Rhyolite overlie the Siebert, forming high hills and peaks. This unit is only known from outcrop exposures near Three Hills, and has not been encountered in drilling. Dikes and domes of the Oddie Rhyolite intrude the older units and are interpreted to be genetically related to the mineralization in the Divide district and at Three Hills. The Divide Andesite, variously described as high level intrusions or flows, is thought by some to be post-mineralization (e.g., Snyder, 1990). A regional geologic map of the Hasbrouck Project area is shown in Figure 7-1.

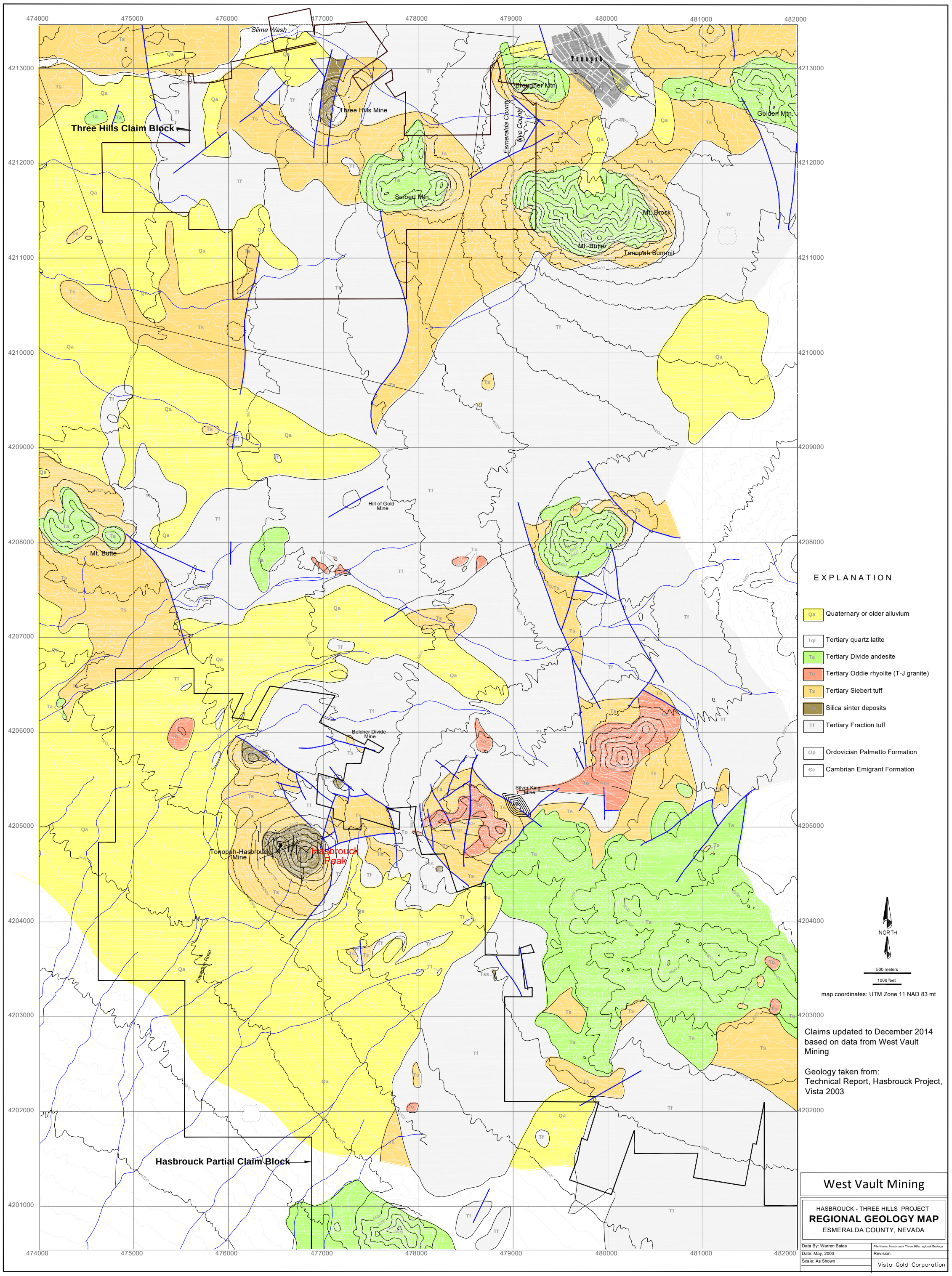

Figure 7-1. Regional Geologic Map of the Three Hills and Hasbrouck Area, Nevada (modified from Prenn and Gustin (2006))

7.1.2 PROJECT GEOLOGY

7.1.2.1 THREE HILLS MINE GEOLOGY

The major rock types within the Three Hills property are, from oldest to youngest, the Mizpah Formation, Fraction Tuff, Siebert Formation, the Oddie Rhyolite and the Brougher Rhyolite. The Siebert Formation unconformably overlies the Fraction Tuff and both are intruded by the Oddie Rhyolite. The majority of the deposit lies within the Siebert Formation.

The Mizpah Formation ranges from trachyandesite to dacite, consisting of up to 700ft of porphyritic lava flows, dikes, lahars, and andesitic volcanoclastics. It is commonly altered hydrothermally, with quartz-sericite-adularia alteration associated with the main stage veins in the Tonopah district. The Mizpah Formation does not crop out in the project area, but can be found in an uplifted block to the east. It is the predominant host rock for Ag-Au vein mineralization in the Tonopah district, and westward extensions of the vein systems have been intercepted by drilling in the Three Hills property. Potassium-argon ("K-Ar") dating of the adularia associated with the mineralization at Tonopah ranges from 19-18 Ma.

The Fraction Tuff has been divided into two compositionally similar members; the Tonopah Summit and the King Tonopah Members. The Tonopah Summit Member is typically a poorly welded, quartz latite to rhyolite, lithic tuff. The King Tonopah Member is a welded rhyolitic, lithic, crystal tuff. K-Ar dates range from 21.5 to 17 Ma for both of the members, but do not clearly define stratigraphy between the two. Alteration is widespread in the Fraction Tuff, and it hosts silver veins and gold mineralization in the Three Hills area.

The overlying Siebert Formation is a sequence of volcaniclastic siltstones, sandstones, tuffs, and conglomerates deposited in fluvial and lacustrine conditions. Rapid facies changes are common in the formation. It has been broken down into two units in the project area: a thin bedded fine-grained tuff, and a coarse-grained volcaniclastic unit. The coarser, more permeable sandstones and conglomerates of the volcaniclastic unit are the preferred hosts for gold mineralization at Three Hills. K-Ar age dating suggests the Siebert ranges between 17-13 Ma in age. The upper parts of the Siebert are likely part of the regionally extensive Mid- to Late-Miocene Esmeralda Formation.

The Oddie Rhyolite is a pinkish-grey, weakly porphyritic, biotite-bearing high-silica rhyolite. It is almost always hydrothermally altered, and is associated with mineralization at Three Hills where domes appear to have proximal lapilli ejecta aprons that formed part of the Siebert Formation. K-Ar dating of the biotite has given an age of 16.9-16.4 Ma

Structure in the project area reflects effects of the Walker Lane dextral strike-slip faulting, superimposed on the Basin and Range extensional block faulting. The ages of the structures are between 26-16 Ma. The Walker Lane strike-slip faulting dominates and trends northwest, developing northeast and north-south trending extensional structures. The Basin and Range block faults trend north-south and form horsts and grabens bounded by high-angle normal faults that flatten to low-angle listric faults at depth. These high-angle faults are a control on the mineralization in Three Hills, where they cut the Siebert Formation, dropping the Siebert to the east, against Fraction Tuff to the west.

At the center of the property the "Three Hills" consist of the north, south, and east hills. Geologic mapping by Thompson (1999) shows the east hill is capped by Brougher Rhyolite, which appears to lie directly over the Siebert Formation as a flow Figure 7-2. Oddie Rhyolite intrudes along north-south structures in the area and occurs as dikes, flows and flow domes. The west side of the south hill contains a flow that intruded along the main fault bounding the mineralization. Several smaller plugs are noted in outcrop and drilling to the east. A minor amount of mineralization has been drilled in the Oddie flows along the western edge of the hills.

The north and south hills are underlain by ash-flow, air-fall and water-lain tuffs and epiclastic sediments of the Siebert Formation. These volcanic and epiclastic units generally dip 30° to 40° to the east, immediately under the two hills, then become west dipping to flat lying under the east hill. The Siebert contains an upper portion dominated by epiclastic sediments and a lower portion containing various lithic, crystal and lapilli ash-flow units with interbedded epiclastic sediments. This is the dominant host for mineralization at Three Hills. The underlying Fraction Tuff is a secondary host to mineralization.

Historical drilling in the northeast portion of the area has encountered West End Rhyolite and Mizpah Andesite at depth. The West End Rhyolite is described as an irregular sill that has intruded the Mizpah Andesite. Drilling is limited, although thin zones of mineralization have been noted in both units. A geological map of the Three Hills area is included as Figure 7-2. An east-west cross-section looking north through the deposit is shown in Figure 7-3, and Figure 7-4 is a north-south cross-section looking west through the deposit.

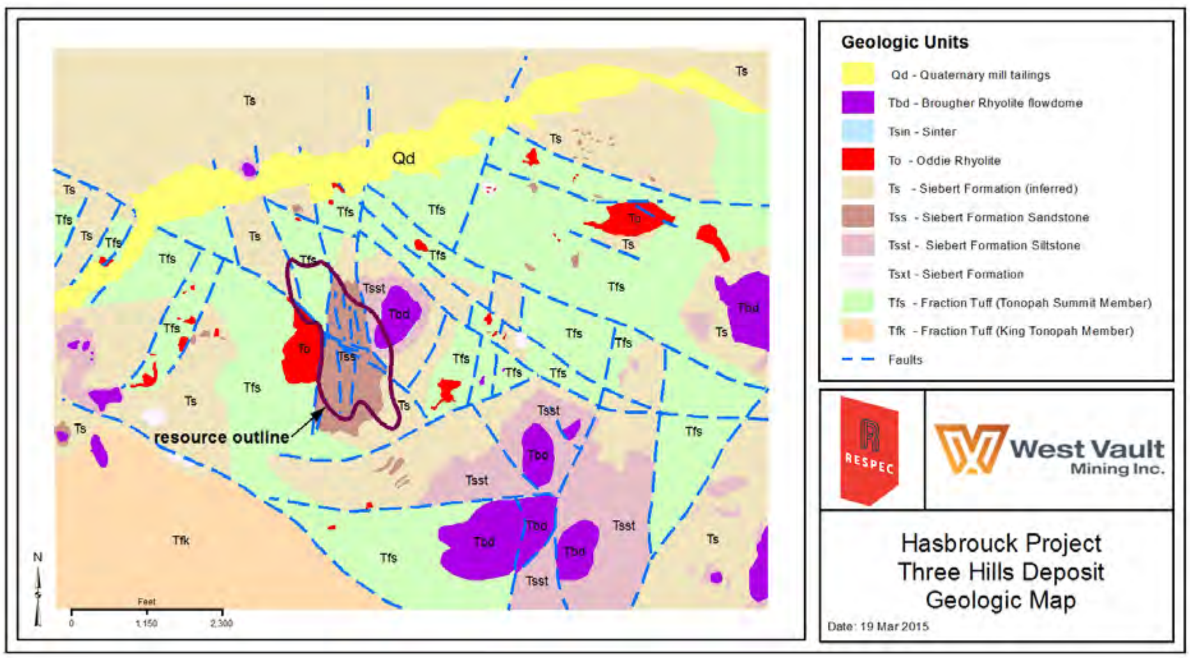

Figure 7-2. Geologic Map of the Three Hills Mine Area
(Modified from Thompson (1999) by WVM, 2015)

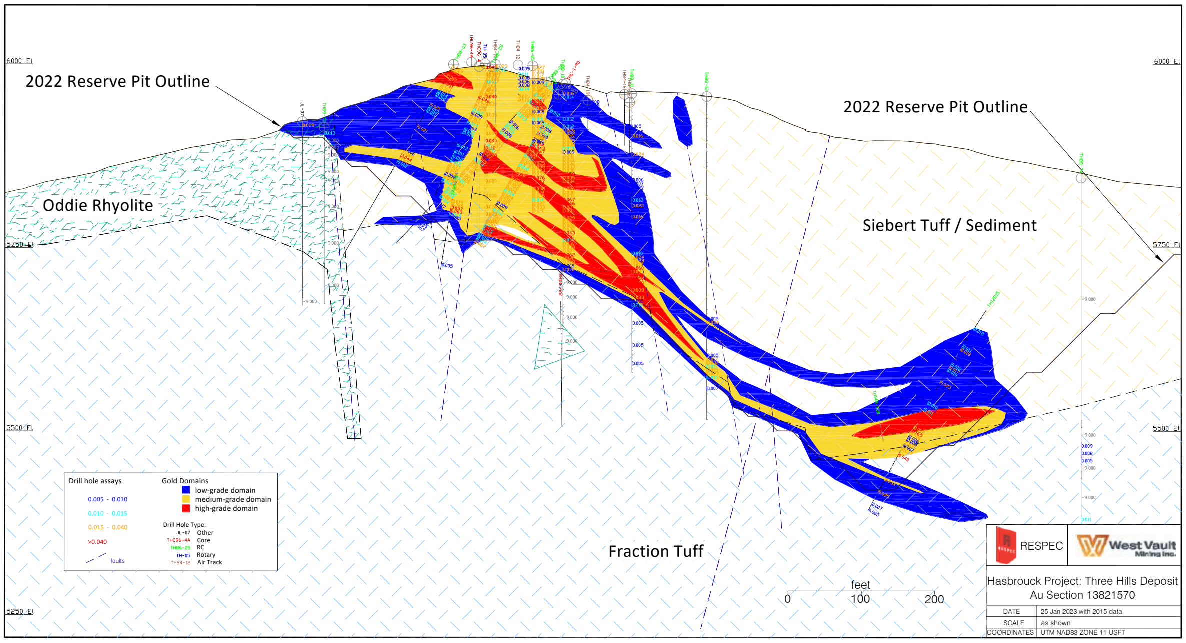

Figure 7-3. Three Hills East-West Cross-section 13821570 Looking North

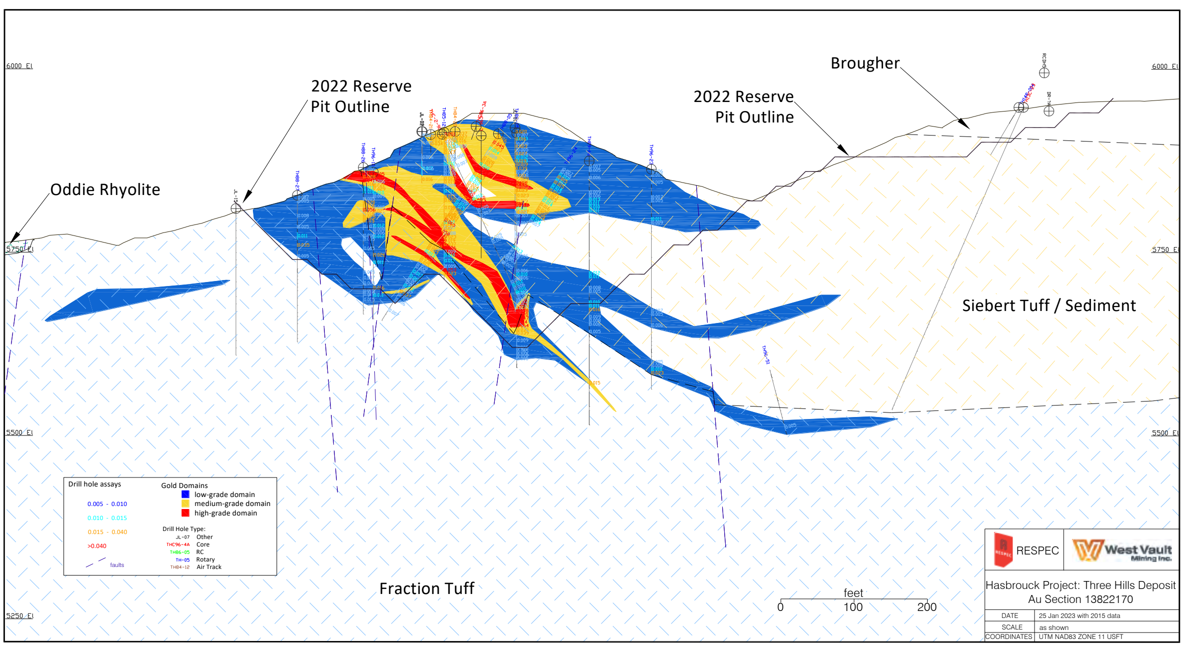

Figure 7-4. Three Hills North-South Cross-section 13822170 Looking West

7.1.2.2 HASBROUCK MINE GEOLOGY

Details of the geology were provided by Graney (1985), who mapped Hasbrouck Mountain in detail and studied the alteration mineralogy as part of a Master's thesis supported by Cordex. The bulk of the topographic high of Hasbrouck Mountain (also known as Hasbrouck Peak) is underlain by ashflow, air-fall and water lain tuffs and volcaniclastic sediments of the Siebert Formation. According to Graney's surface mapping, these volcanic and volcaniclastic units generally dip 10 to 40 degrees to the west and southwest, with the average dip being 20 degrees to the west. As at Three Hills, the upper portion of the Siebert Formation at Hasbrouck is dominated by epiclastic sediments, mostly sandstones and conglomerates of volcanic origin. Graney mapped several occurrences of chalcedonic sinter deposits, produced during hot spring activity, near the summit of the mountain. Hydrothermal breccias are exposed in various areas, especially along the western and northern slopes of Hasbrouck Mountain, generally to the north (in the hanging wall) of the Kernick structure. The lower portion of the Siebert Formation at Hasbrouck consists of various lithic, crystal and lapilli ash-flow units with interbedded epiclastic sediments. The Siebert Formation is underlain by the Fraction Tuff, which is exposed along the eastern base of Hasbrouck Mountain. The Fraction Tuff in this area is composed of lithic-rich ash flow tuff. Fluvial sandstones and conglomerates occur in the Siebert Formation immediately above the Fraction Tuff. The Fraction Tuff dips 40 degrees to the west (Graney, 1985).

Graney (1985) mapped a series of generally north- to northeast-trending normal faults that cut Hasbrouck Mountain and are interpreted by Graney to be post-mineral structures. Most of these structures have displacements on the order of 100ft or less. The mineralized Kernick structure, which was the focus of historical underground production at Hasbrouck, trends roughly east-west across the western ridge of Hasbrouck Mountain and is reported to dip to the north at angles of 50 to 70 degrees (Graney, 1985).

Remapping of Hasbrouck Mountain by Allied's geologists led to a re-interpretation of the structural framework and the relationship of various structural orientations to mineralization (Figure 7-5 through Figure 7-8). High-angle faults mapped on Hasbrouck Mountain can generally be grouped into three orientations, north-south, N20°-35°E, and N40° – 60° W (Carter, 2011; Kunkel, 2012). North-south faults are the most prominent and appear to offset all other fault orientations (Figure 7-5). Offsetting relationships observed in outcrop of the northeast fault sets and northwest fault sets is equivocal.

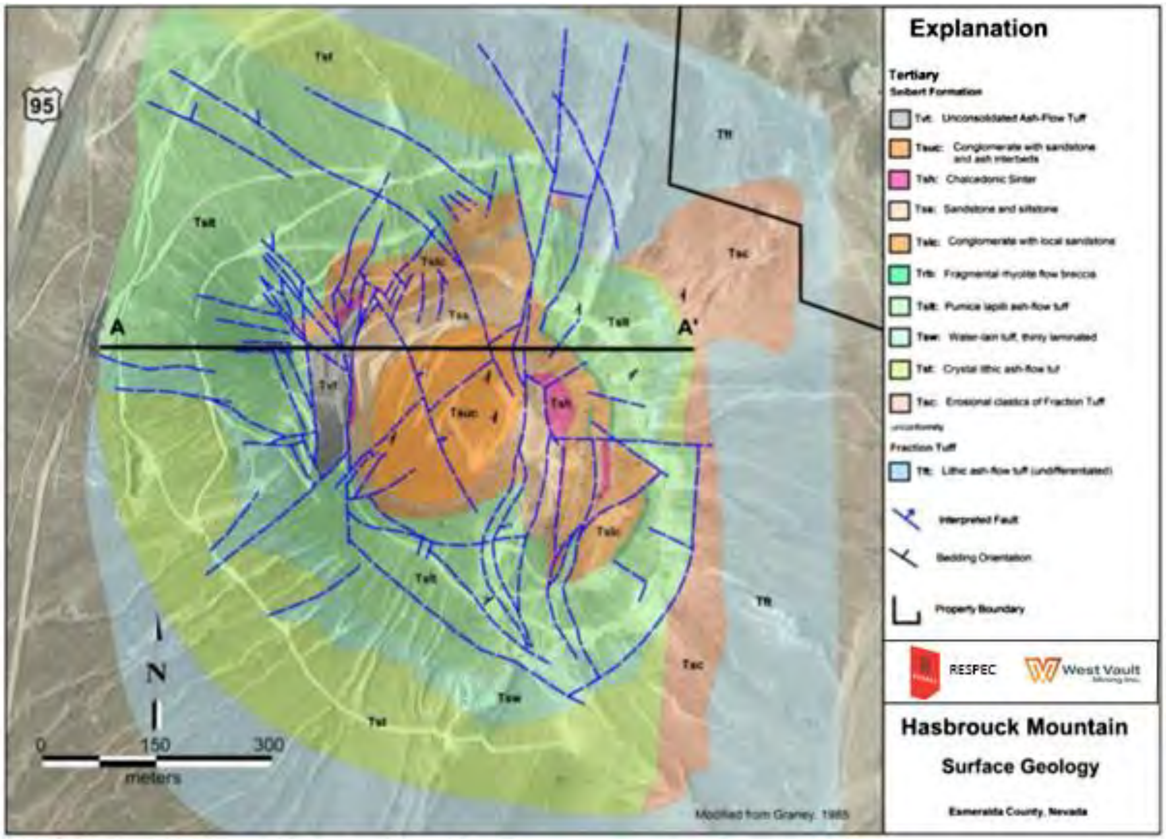

Figure 7-5. Geologic Map of the Hasbrouck Mine
from Wilson (2014)

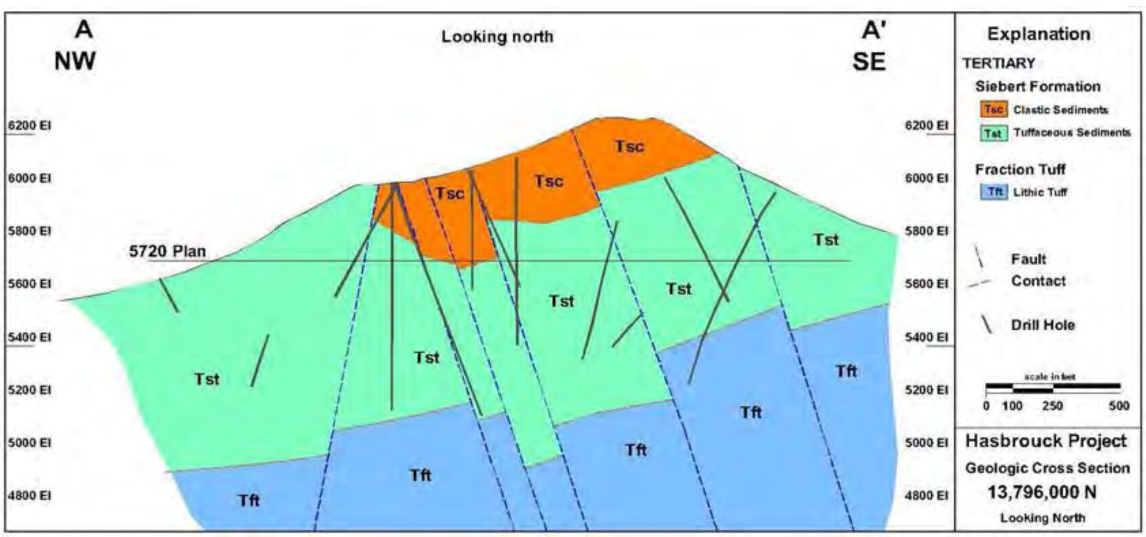

Figure 7-6. East-West Cross-section Hasbrouck Mine
from Wilson (2014), looking north

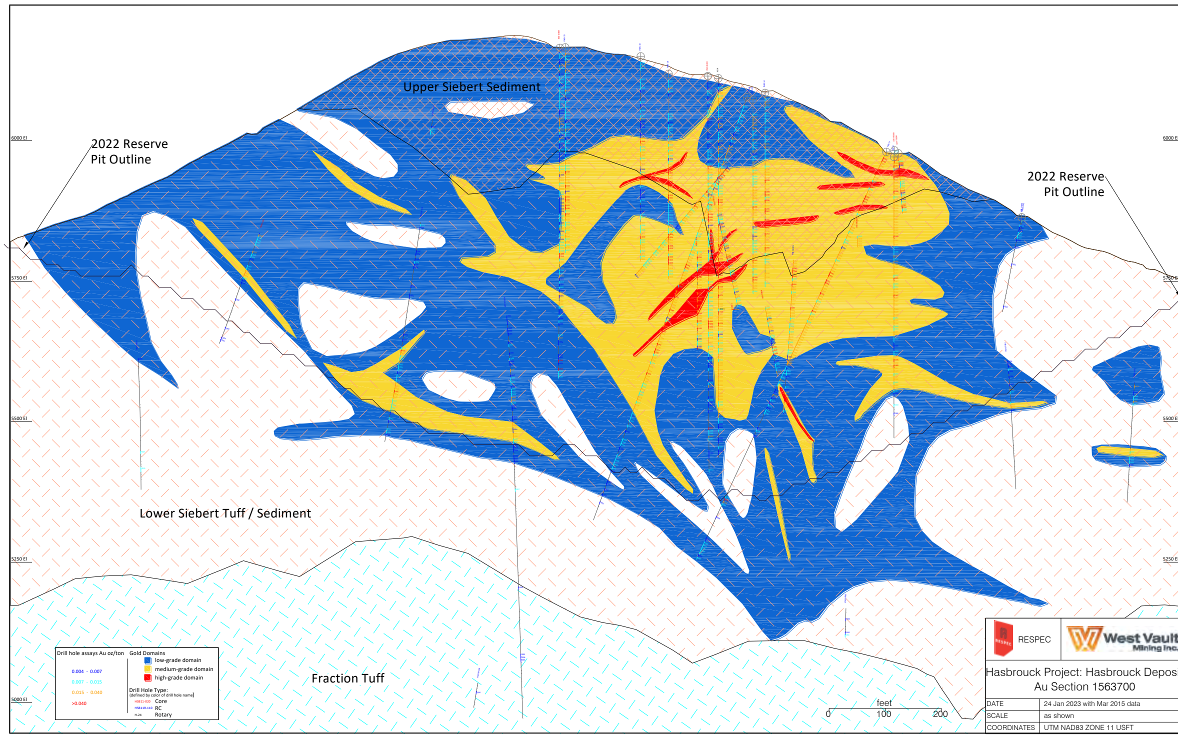

Figure 7-7. Hasbrouck Mine North-South Au Section 1563700 (Looking West)

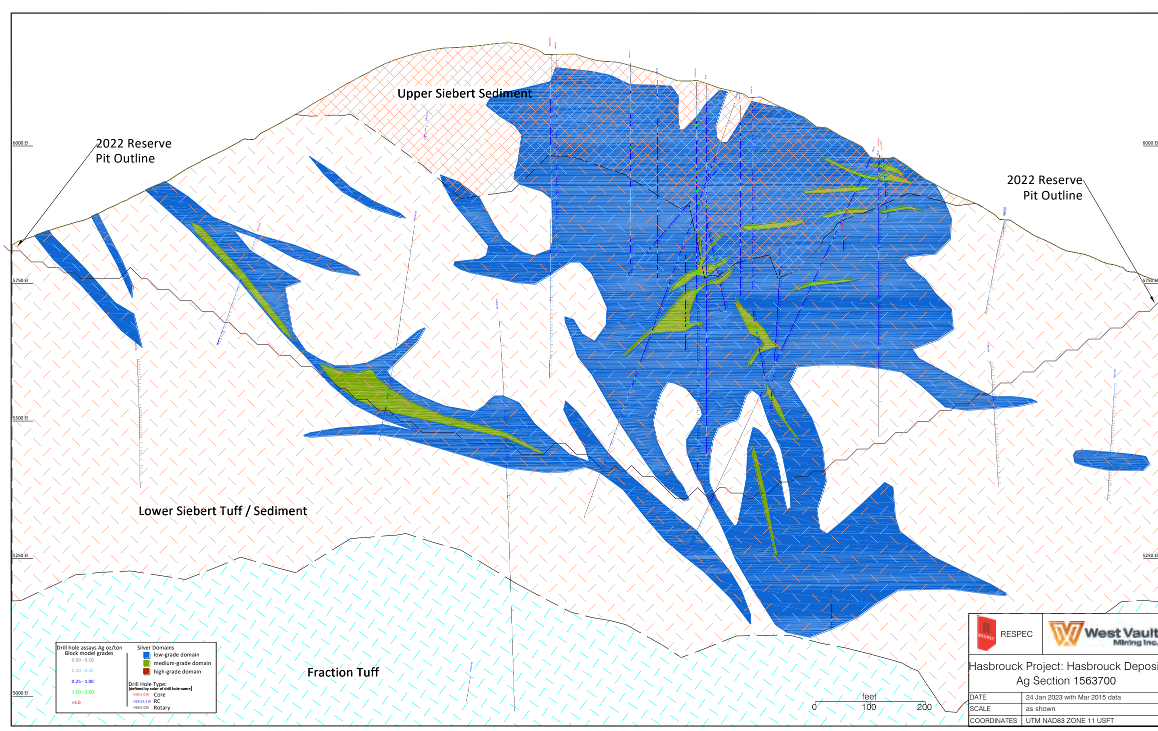

Figure 7-8. Hasbrouck Mine North-South Ag Section 1563700 (Looking West)

North-south faults are typically very high angle and may dip both to the east and west creating a series of horsts and grabens. Apparent normal offset appears to be on the order of several tens of feet to 100ft, but local evidence suggests there is also a strike-slip component. Northeast trending faults appear to be moderate to high-angle, dipping both to the northwest and southeast. Mapped northwest trending faults are more cryptic and discontinuous, typically forming broad, brecciated, steeply dipping zones.

7.1.2.3 HILL OF GOLD GEOLOGY

According to Hardy and Ristorcelli (1996), the major rock types at the Hill of Gold area are the same as those found at Three Hills Mine. The Siebert Formation overlies the Fraction Tuff, and both are intruded by the Oddie Rhyolite.

The "hill" at Hill of Gold, is capped by Oddie Rhyolite. It is in the form of a northeast trending dike which extends to the north and northwest cutting the Siebert Formation. The remainder of rocks in the area are assigned to the Fraction Tuff.

The southeastern side of the Oddie dike is in fault contact with the Fraction Tuff. This structural zone strikes northeasterly, is between 50ft and 100ft wide and dips at about 50° to 70° to the northwest.

7.2 MINERALIZATION

7.2.1 THREE HILLS MINERALIZATION

The drill-defined extent of Three Hills gold mineralization is approximately 1000ft east–west by 2700ft north–south with a maximum depth of 500ft along the down-dip eastern edge of the deposit. Mineralization remains open at depth to the east and southeast along the Siebert-Fraction contact.

Gold mineralization at Three Hills is commonly associated with areas of higher permeability lithologies, rock unit contacts, and structural features. Previous authors have described the mineralization as "disseminated" though examination of outcrops and drill core shows the higher gold grades associated with discontinuous, irregular 0.05- to 0.5inch-wide veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz. Lower gold grades in the top of the south hill are found in zones of grey to brown chalcedony, and hydrothermal breccia veins and pipes. Figure 7-9 presents a level plan at the 5730ft elevation showing gold mineralization.

Tregaskis and Garratt (1998) described mineralization as being "intimately related" with alteration at Three Hills. The main Mineral Resource is situated within a broad zone of pervasive silicification in the Siebert Formation and the upper 10-30ft of the Fraction Tuff. The contact between these two units contains consistently higher grades of gold and is more commonly argillized than silicified. The contact zone between the Siebert and Fraction controls mineralization lateral to the core of the deposit.

Hydrothermal fluids precipitated adularia and quartz as the stable alteration assemblage such that the bulk of the mineralization occurred in rocks with cloudy adularized feldspar crystals, bipyramidal quartz crystals, quartz overgrowths, occasional preserved biotite flakes, and a silicified matrix. Argillic alteration (illite ± montmorillonite) forms an envelope around the silicified and mineralized zones, and along the Siebert–Fraction contact. Subsequent to mineralization Three Hills Mine has been pervasively oxidized and Tregaskis and Garratt (1998) proposed that the gold was initially precipitated with pyrite that has now oxidized to goethite, hematite, and/or jarosite. Thompson (1999) proposed that the potassic alteration was a relatively early event and produced brittle rock that was later fractured by Walker Lane faulting.

Thompson (1999) mapped a series of Walker Lane structures oriented approximately N45W. The amount of strike slip movement is generally unknown, but is believed to have resulted in development of northeast and north-south trending extensional faults. These high angle structures form a series of horsts and grabens at the center of the property. Displacement along the north-south extensional faults ranges from 10-500ft. Three Hills Mine appears to be bounded by north-south faults and the western-most fault has been interpreted as a conduit for the emplacement of Oddie Rhyolite.

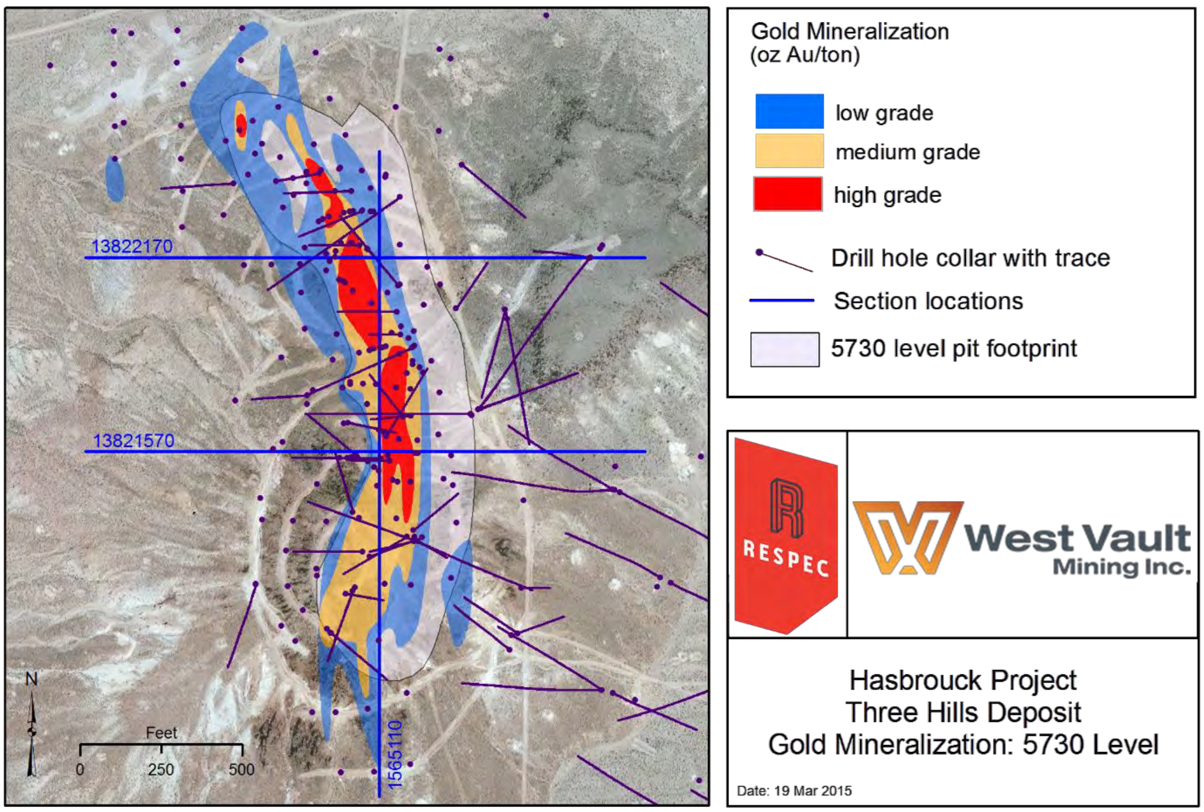

Figure 7-9. Three Hills Level Plan 5730 Elevation

7.2.2 HASBROUCK MINERALIZATION

Hasbrouck mineralization has a 2,800ft east–west by 2,400ft north–south areal extent, with a maximum depth of 900ft. Mineralization is open at depth and to a limited extent to the north and east.

Precious metals mineralization at the Hasbrouck Mine is concentrated within the Siebert Formation, stratigraphically below the chalcedonic sinter horizons that outcrop near the peak of Hasbrouck Mountain (Graney, 1985). The overwhelming bulk of mineralization lies within the Main zone, a west-northwest-trending zone underlying Hasbrouck Mountain and parallel to the Walker Lane, while the smaller, east-west-trending, South zone occurs along the south flank of Hasbrouck Mountain approximately 700ft to the south of the Main zone. Weakly mineralized, sub-parallel structures occur between the Main and South zones.

The Kernick structure, which was the focus of historical underground at Hasbrouck, strikes roughly east-west across Hasbrouck Mountain and dips to the north. The majority of the mineralization in the deposit occurs in the hanging wall of the structure with the highest gold grades associated with 0.05- to 1.0inch wide, generally near-vertical, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccia. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent throughout the deposit, but is especially evident in many of the moderate-grade zones (0.01 to 0.05 oz Au/ton) along the peripheries of the deposit. This stratigraphic control was commonly cited by geologists of the companies involved at Hasbrouck in the past (e.g., Graney, 1985).

The Kernick structure served to focus higher-grade zones, although other such zones occur somewhat irregularly throughout the mineralized body in the hanging wall of the structure. A minor amount of mineralization lies in the footwall of the Kernick structure, along what are interpreted to be smaller, subsidiary structural zones.

The mineralization at Hasbrouck is accompanied by strong pervasive silicification, with associated adularia and pyrite, within the volcaniclastic rocks and lapilli tuff units of the Upper Siebert Formation (Graney, 1985). Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones.

Gold occurs as electrum, as inclusions in pyrite and in goethite derived from the partial to complete oxidation of pyrite, and within siliceous gangue minerals (Graney, 1985; Hazen, 1989). Silver occurs in the native state and in argentite (Wittkopp, 1982). Silver is also intimately associated with iron oxides derived from the oxidation of silver-rich sulfide minerals that occurred as inclusions in pyrite (Wittkopp, 1982).

Hasbrouck mineralization is primarily characterized as structurally controlled, with secondary lithologic control. West-northwest and northeast fault orientations localize higher-grade mineralization (+0.05 oz Au/ton) with lower grade material occurring as halos and straddling the clastic and tuffaceous package contact within the Siebert Formation. North-south faults appear to be late-stage or offset mineralization. Mineralization remains open at depth along the intersection of the cross-cutting structural fabrics. However, deeper drilling into the Fraction Tuff has yet to intersect significant mineralization. Figure 7-10 presents a level plan at the 5,845ft elevation showing gold mineralization.

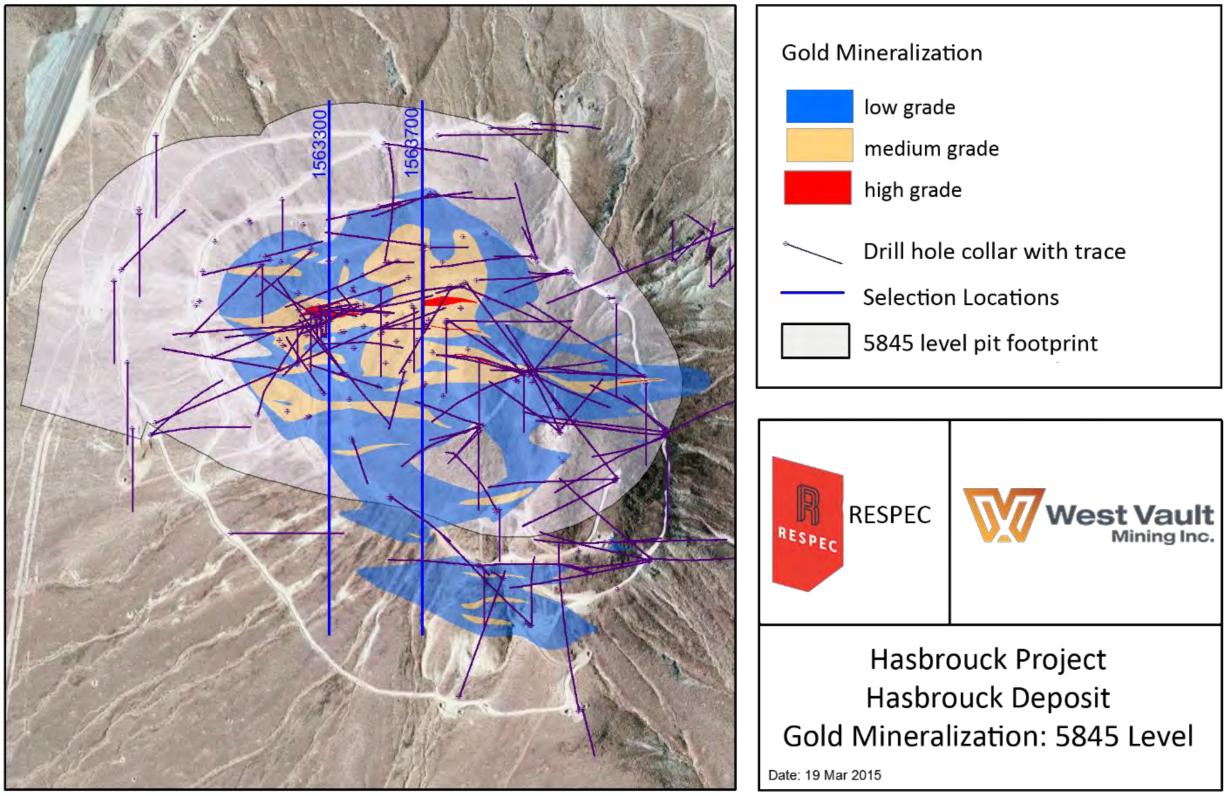

Figure 7-10. Hasbrouck Mine Level Plan 5845 Elevation

Brecciated veins associated with northwest structures are dark gray to brick-red in color, and 0.05- to 20 inches in width. The breccia fragments are monolithic, and float in the silica matrix. Outcropping veins have the appearance of jasperoid, and strike parallel to the northwesterly-trending structural fabric. This vein type has been encountered in core holes. Banded quartz veins range from 0.05inches to as much as several inches in width. These veins parallel local structural trends, and consist of cream–white to tan to brown colored parallel bands from <0.05- to 0.5 inches in width. Veins have been noted in outcrop to undulate, and follow the outer trace of large blocks of fractured rock. A vein swarm trending northeast was noted to dip both to the east and west, but not to offset each other. Stockwork quartz–sulfide veins are typically up to 0.5inch in width. Silica occurs as gray or clear quartz selvages, with a center line of sulfides (typically oxidized). Occasionally, oxidized sulfides form selvages about the veins. Rare euhedral pyrite has been noted in some veins. Veins cross cut each other, and form a crude orthogonal set. Native gold in the form of small grains was noted in one vein along the center oxidized sulfide line.

Hydrothermal breccia zones contain diffuse silica flooding that crudely defines large vein zones. This silica is typically a medium brown color and has alternating bands of lighter and darker silica. The bands enclose and sometimes cross-cut breccia fragments. Veins in breccia zones often contain rock or vein fragments from rock units different than the surrounding rock, indicating transport. Vein margins may be planar, colloform, or crenulated.

7.2.3 HILL OF GOLD MINERALIZATION

The following text is taken from Hardy and Ristorcelli (1996):

"Gold mineralization is found in two settings. The first is within a northeast trending structural zone and the second is at, or near, the Oddie-Siebert and Oddie-Fraction contact to the west and northwest. The two zones potentially share the same source of gold mineralization although drill hole data has revealed that the two zones are physically separate in most locations. There is a possibility that the two zones join at depth, about 5400 ft to 5600 ft elevation (around 100 ft to 300 ft in depth), in the center of the deposit. This area, which is roughly about 200 ft along strike and around 70 ft wide, has not yet been interpreted. Both zones extend to the surface.

The gold mineralization in the structural zone is found in long narrow "lenses" with the longest dimension parallel with the strike of the zone. The narrowest dimension is perpendicular to the dip of the zone. Dimensions down dip can be close to the dimensions along strike. The presence of earlier underground workings in this structural zone implies that high-grade mineralization existed here. The highest assay value in the drilling data, 0.759 oz Au/ton, is located in this zone which suggests that areas of high grade mineralization may still exist. This zone is referred to as Zone 2.

Mineralization along the Oddie contact is a single large zone, striking generally parallel to the structural zone. It dips to the southeast which is opposite of the dip of the structural zone. The mineralized zone is larger and more continuous than the structural mineralization, although it has been identified with fewer drill holes. Because of the limited drill data in this zone, MDA has lower confidence in its location, average gold grade, and extent. The zone is basically open on both the northeast and southwest ends. Selective placement of a few drill holes would help define the actual extent of the zone. This zone is labeled Zone 1.

Any material not included in the above mentioned Zones 1 and 2 is classified as Zone 9 for modeling convenience."

8.0 DEPOSIT TYPE

The section has been modified from Dyer et al. (2016), Prenn and Gustin (2006), Wilson (2014), and sources therein.

Hasbrouck Mountain represents an erosional remnant of a Miocene geothermal system that produced epithermal precious metals mineralization in and beneath a hot springs environment. Examples of this type include the McLaughlin deposit in California and the Crowfoot-Lewis (Hycroft) and Hog Ranch deposits in Nevada, as well as Ladolam–Lihir deposits in Papua New Guinea. In common with these larger examples, gold and silver mineralization at Hasbrouck appears to have been emplaced at very shallow depths, and is associated with young hot spring-related systems with siliceous sinter deposits. In addition, the mineralized zones are typically associated with silica ±adularia replacement of volcaniclastic host rocks. These types of deposits contain characteristically low concentrations of both total sulfide minerals and base metals.

Three Hills Mine is also considered to be a low-sulfidation, epithermal, volcanic-hosted precious-metals system. The bulk of the mineralization is within silicified portions of the Siebert Formation and along the Fraction Tuff/Siebert contact, associated with hydrothermal breccias, discontinuous narrow veins, sheeted vein zones and stockworks. Hydrothermal fluids circulated through faults and fractures until reaching the more permeable horizons of the Siebert Formation where they spread laterally, depositing gold and silver minerals.

A description for low-sulfidation epithermal deposits in general is modified below from Panteleyev (1996). Low-sulfidation epithermal deposits form within high-level, non-marine hydrothermal systems, which vary in crustal depths from about 3,280ft, to surficial hot spring settings. Host rocks range from volcanic rocks to sedimentary units. Calc-alkaline andesitic compositions predominate as volcanic rock hosts, particularly for the more base-metal rich, intermediate sulfidation subclass, but many deposits occur in more felsic units within terranes of bimodal volcanism and extensive subaerial ashflow deposits. Clastic and epiclastic sediments in volcanic basins and structural depressions are the principal non-volcanic host rocks.

Mineralization in the near-surface, epithermal environment takes place in and beneath hot springs, and the slightly deeper underlying hydrothermal conduits. Normal faults, margins of grabens, coarse clastic caldera moat-fill units, radial and ring dike fracture sets, and hydrothermal and tectonic breccias can act as hydrothermal fluid channeling structures. Through-going, branching, bifurcating, anastomosing and intersecting fracture systems are commonly mineralized. Mineralization commonly forms where dilatational openings and cymoid loops develop, typically where the strike or dip of veins change.

Silicification is the most common alteration type with multiple generations of quartz and chalcedony, which are typically accompanied by adularia and calcite. Pervasive silicification in vein envelopes is in many cases flanked by sericite–illite–kaolinite assemblages. Kaolinite-illite–montmorillonite ± smectite can form adjacent to veins; kaolinite–alunite (advanced argillic alteration) may form along the tops of mineralized zones, above the paleo-water table. Propylitic alteration dominates at depth and along the deposit margins.

Mineralization characteristically comprises pyrite, electrum, gold, silver, and argentite. Other minerals can include silver sulphosalt and/or selenide minerals, chalcopyrite, sphalerite, and galena. Tellurides, roscoelite and fluorite are abundant in alkalic-rock hosted systems, which may include significant molybdenite as an accessory mineral.

9.0 EXPLORATION

This section is modified from Dyer et al. (2016). WVM's subsidiary, WK Mining (USA) Ltd., completed the acquisition of an initial 75% interest in the Three Hills and Hasbrouck parts of the property from subsidiaries of Allied on April 24, 2014 and acquired the remaining 25% interest in August of 2020.

9.1 THREE HILLS MINE EXPLORATION

WVM performed geologic mapping, sampling, a gravity survey and detailed structural analysis at Three Hills during 2014. A total of 27 surface rock-chip samples were collected and assayed at ALS Chemex gold, silver and 45 major, minor and trace elements. The gravity survey was completed by Magee Geophysical Services in June, 2014. Gravity measurements were conducted at 164 gravity stations spaced on a 656-foot by 656-foot (200m by 200m) grid over the western two thirds of the property. In addition, WVM extracted a 20-ton bulk sample of mineralized rock for testing of run-of-mine type metallurgical recoveries.

During 2014, WVM drilled 3 diamond-core holes and 11 RC holes for a total of 9,077ft of drilling at Three Hills Mine (see Section 10.1). The diamond-core holes were drilled within the Three Hills gold mine to obtain samples for geotechnical studies. The 2014 RC holes were drilled mainly to expand the eastern and down-dip portions of Three Hills Mineral Resource, with one hole being drilled as a ground-water monitoring well. For the 2016 PFS of Dyer et al., the 2014 drill results were compared to the then-existing Mineral Resource block model. As stated by Dyer et al. (2016):

> *"WKM drilled three core holes for geotechnical purposes, ten RC exploration holes, and one water well which was logged and sampled for assay, in 2014. These drill data were received by MDA after completion of the current Mineral Resource Estimate. MDA reviewed the data and determined that the 2014 drilling would have no material impact on the Mineral Resource model or estimate."*

For the current Mineral Resources presented in Section 14.2.9, the author has reviewed the 2014 drilling and concludes that the 2014 RC holes do not materially affect the Mineral Resource Estimate and therefore have not been included in the current Mineral Resource database.

9.2 HASBROUCK MINE EXPLORATION

At Hasbrouck Mountain, WVM carried out geologic mapping, surface sampling and a structural geologic interpretation. A sequence of 36 continuous rock-chip samples were taken from a road cut within the Mineral Resource and assayed at ALS Chemex for gold, silver and 45 major, minor and trace elements. The results confirmed mineralization at the surface between drill holes. Approximately 52 surface rock-chip samples were collected from the northeast flank of Hasbrouck Mountain and assayed for gold, silver and 45 major, minor and trace elements at ALS Chemex. The results from these samples led WVM to identify a zone of east-west mineralized structures northeast of the Hasbrouck Mineral Resource. This zone was later tested with RC drilling during WVM's 2014 drilling campaign (see below and also Section 10.2). WVM also conducted a re-interpretation of geophysical data obtained by previous operators.

A total of 4,320ft of RC drilling in 14 holes was performed by WVM at Hasbrouck Mountain during 2014. One RC hole was drilled in 2018 by WVM at Hasbrouck Mountain. All drilling was done to the south, southeast, north and northeast of the current Mineral Resources, for condemnation and to discover mineralization that may extend beyond the current Mineral Resources.

Eight of the RC holes were drilled to test the east-west structures identified with the 2014 surface rock-chip sampling. The 2014 drilling is widely spaced, outside of, and does not materially affect the estimated Mineral Resources; as such, it has not been included in the current Mineral Resource database.

During 2014, WVM extracted a 2-ton bulk sample of mineralized rock for testing in a HPGR comminution scenario (see 13.4.6). Later, in 2018, WVM drilled one RC hole to a depth of 500ft.

9.3 HILL OF GOLD EXPLORATION

At Hill of Gold, WVM drilled one RC hole in 2017 and two RC holes in 2018. The 2017-2018 RC holes were drilled mainly attempting to expand the historical 1996 estimate of mineralized material. It is the author's opinion that the 2017-2018 RC results would not materially affect the 1996 estimate due to their locations.

These drill holes were drilled after the 1996 Mineral Resource completed by MDA and do not materially affect the model.

10.0 DRILLING

This section is modified from Dyer et al. (2016). Drilling at the Hasbrouck property has taken place at three separate areas: Three Hills Mine, the Hasbrouck Mine and Hill of Gold. From 1974 through 2018, seven companies have drilled in the vicinity of the estimated Mineral Resources described in this report at Hasbrouck Mountain, seven companies have drilled at Three Hills, and five companies have drilled at Hill of Gold for a compiled database of approximately 348,475ft in 747 drill holes (Table 10-1). This includes the drilling done in 2014 through 2018 by WVM.

Drill holes used for Mineral Resources estimated in this report are summarized in Table 10-2 and Table 10-3. The earliest drilling utilized conventional rotary methods; however, the majority of the drilling utilized RC methods. Drill spacing for Three Hills estimated Mineral Resources is generally 75-100ft but locally is less than 50ft within the center of the deposit. Drill spacing for the Hasbrouck Mineral Resources is generally 100-150ft but locally is less than 50ft within the center of the deposit.

Table 10-1 Summary of Drilling in the Hasbrouck Property

Year	Company	Area	Holes	Feet
1974 - 1980**	Cordex	Hasbrouck Mtn	25	10,629
1974 - 1985*	Cordex	Hill of Gold	10	867.8
1974	Cordex	Three Hills	14	5055
1982 - 1985	Crown Resources	Hill of Gold	57	1,2126
1985	Franco-Nevada	Hasbrouck Mtn	30	10,156
1984 - 1988	Saga Exploration	Three Hills	54	5,095
1988	FMC	Hasbrouck Mtn	76	34,255
1988*	Phelps Dodge	Hill of Gold	16	6,640
1988 - 1989	Echo Bay	Three Hills	77	26,040
1990	Gexa Gold	Three Hills	2	508
1992***	Corona Gold	Hasbrouck Mtn	2	1,210
1991 - 1997 *	Eastfield	Three Hills	119	38,822
1996	Euro-Nevada	Hasbrouck Mtn	18	17,670
1996	Eastfield	Hill of Gold	19	7,490
2010 - 2012	Allied Nevada	Hasbrouck Mtn	171	145,699
2012 - 2013	Allied Nevada	Three Hills	25	12,679
2014****	West Kirkland	Hasbrouck Mtn	14	4,320
2014****	West Kirkland	Three Hills	14	9,077
2017-2018	West Kirkland	Hill of Gold	3	1,285
2018****	West Kirkland	Hasbrouck Mtn	1	500
		Totals	**747**	**350,123.8**

* Includes holes not in Mineral Resource database due to uncertain depths

** Includes three holes not in Mineral Resource database due to uncertain locations

*** External to Mineral Resources, not in current Hasbrouck Mineral Resource database

**** Not included in current Mineral Resource estimation

Three Cordex drill holes are not included within the Hasbrouck Mineral Resource database due to uncertain collar locations. They are included in the project-wide drill totals for completeness.

The two RC drill holes drilled by Corona in 1992 are located well to the north of Hasbrouck. Due to their location, these latter holes are not included in the current Hasbrouck database (see Section 10.2) but are included in the project totals for completeness.

The locations of drill holes in the vicinity of Three Hills estimated Mineral Resources are shown in Figure 10-1, and the locations of drill holes in the vicinity of the Hasbrouck estimated Mineral Resources are shown in Figure 10-2.

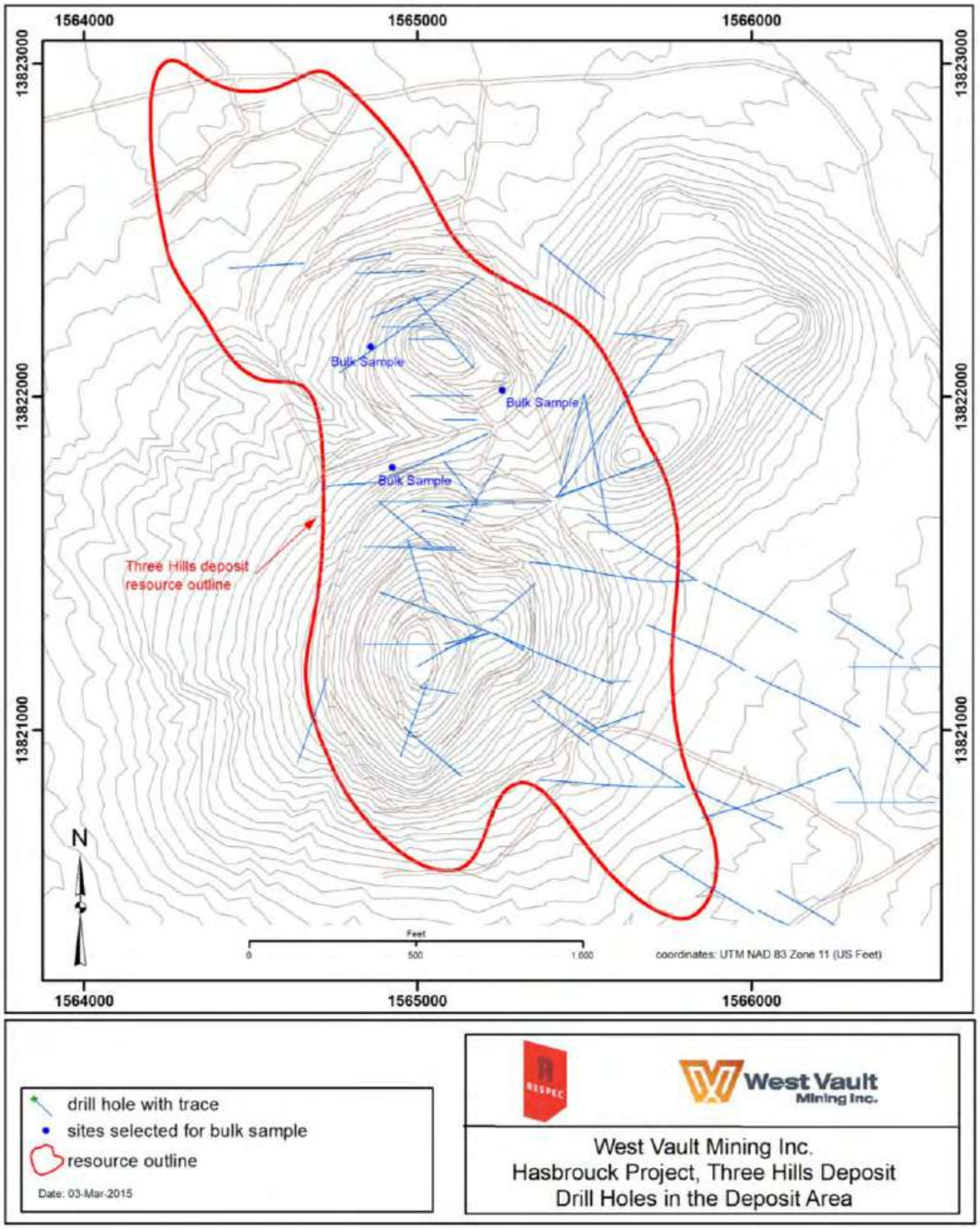

Figure 10-1. Drill Hole Location Map for the Three Hills Area

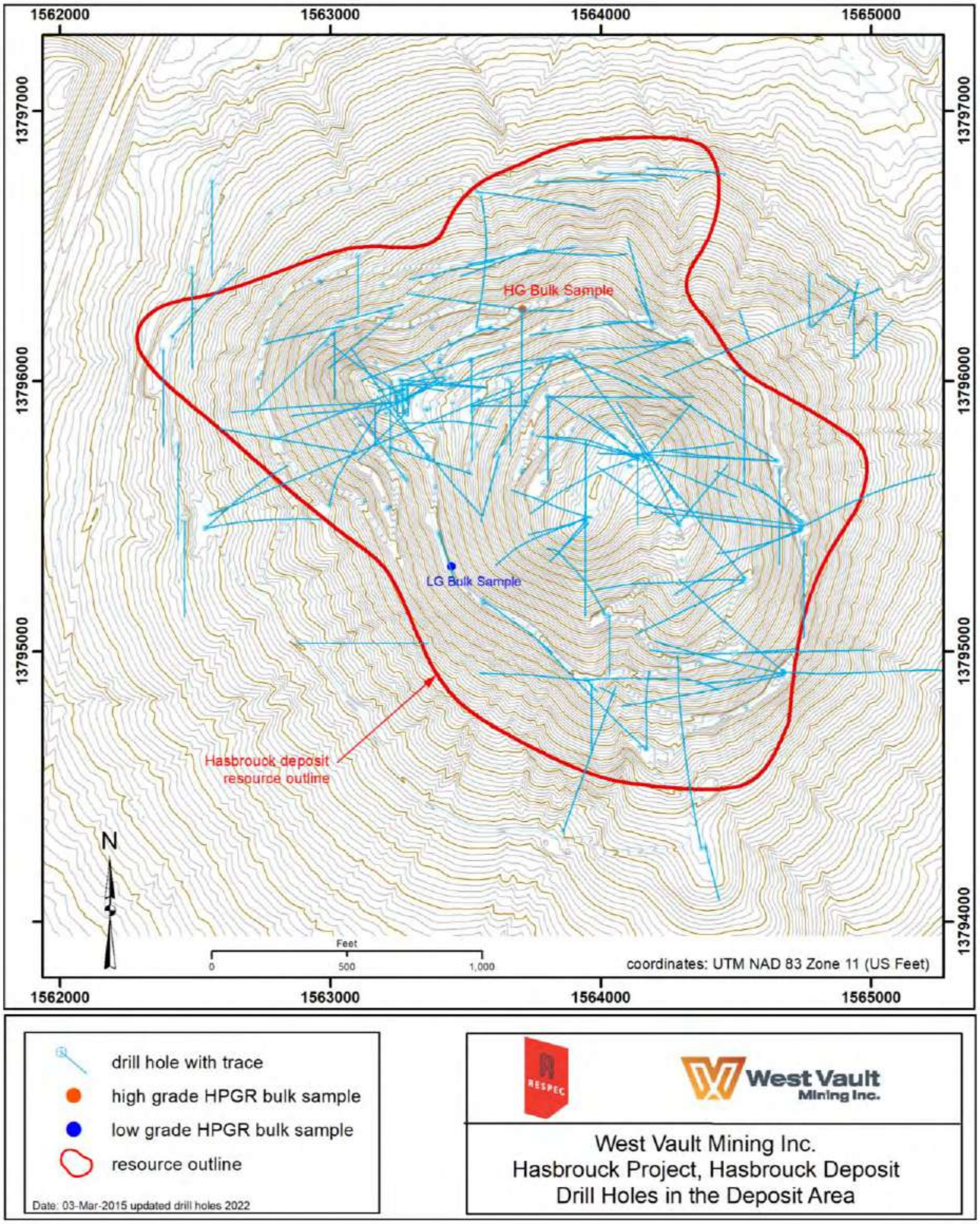

Figure 10-2. Drill Hole Location Map for the Hasbrouck Mountain Area

10.1 DRILLING AT THREE HILLS MINE

Drilling used for the estimation of gold Mineral Resources at Three Hills is summarized in Table 10-2. The current Mineral Resource database includes 291 drill holes for a total of 88,199ft of historical drilling completed from 1974 through 2013. Drilling and sampling procedures used prior to 2012 are not well known. Most of the drilling was completed by RC methods and most of these holes did not intersect water. In 1974, Eklund Drilling used a Gardner Denver 15W drill rig. Drilling in 1996 and 1997 included that done by Hackworth Drilling of Elko Nevada, using a Schramm C-560 RC drill rig, with a nominal 5.5in hole size, predominately using a down the hole hammer. Some drilling with tricone drill bits in difficult rock was mentioned in the reports. No information is available for drill sample recovery prior to 2012.

Table 10-2 Summary of Drilling in the Vicinity of Three Hills

Year	Company	Type	Holes	Feet
1974	Cordex	Rotary	14	5,055
1984	Saga Exploration	Air-Track	31	1,560
1985	Saga Exploration	RC	15	2,060
1986	Saga Exploration	RC	8	1,475
1988	Echo Bay	RC	40	12,335
1989	Echo Bay	RC	37	13,705
1990	Gexa Gold	Core	2	508
1991*	Eastfield	Unknown	31	5,312
1996	Eastfield	RC	56	20,160
1996	Eastfield	Core	8	1,395
1997	Eastfield	RC	24	11,955
2012	Allied Nevada	RC	17	9,170
2013	Allied Nevada	Core	8	3,509
		Historical Totals	*291*	*88,199*
2014****	West Kirkland	RC	11	7,200
2014****	West Kirkland	Core	3	1,877
		WVM Totals	*14*	*9,077*

* Includes holes not in Mineral Resource database due to uncertain depths

****Not included in current Mineral Resource estimation

Little is known about the sampling methods for holes prior to 1996, however, for the most part dry samples were collected from dry RC drilling, sampled continuously down-hole on 5-foot intervals. The initial sampling by Cordex in 1974, and by Saga Exploration in 1984, was from conventional rotary drilling generally sampled on 10-foot intervals.

A total of 10 core holes were drilled prior to 2012. Only the first two core holes completed by Echo Bay were logged, split, and sampled for assays. Of the eight core holes drilled by Eastfield, only portions of two holes were split (THC96-1 and THC96-6), and the rest of the Eastfield core holes were used for metallurgical tests. The Eastfield core hole THC96-4A is included within the database; however, other than the collar location, there is no additional drill information within the database; the depth is noted as zero and there are no assays.

The digital database includes lithology codes for 221 of the 266 pre-2012 drill holes. No lithologic data were available for the 1991 Eastfield drilling (a total of 31 holes) as well as a few holes from various other drill campaigns.

The assay labs used by Cordex included Hunter, Union, and Rocky Mountain Geochem. All of the Eastfield work was completed at Chemex Labs. Most of the assays are inferred to have been completed using fire assay techniques (Prenn, 2003, 2006).

10.1.1 DRILLING AT THREE HILLS BY ALLIED NEVADA

Allied Nevada drilled 17 RC holes in 2012, and focused on expanding known mineralization. During 2013 Allied Nevada drilled eight core holes for metallurgical samples and condemnation. Drilling in 2012 and 2013 totaled 12,679ft.

10.1.2 DRILLING AT THREE HILLS BY WEST VAULT MINING

In the fall of 2014, WVM completed 11 RC holes and 3 diamond-core holes for a total of 9,077ft of drilling at Three Hills. The core holes were drilled within the estimated Mineral Resource to obtain samples for geotechnical studies such as pit-slope planning. First Drilling Group USA conducted the core drilling with a track-mounted LF90 drill. PQ and HQ diameter core was recovered by triple tube methods with a 5ft core barrel.

The 2014 RC holes were drilled for Mineral Resource expansion mainly in the eastern, down-dip portion of the estimated Mineral Resource and are mainly east of the proposed open-pit extents. Boart Longyear performed the RC drilling with the same track-mounted MPD 1500 drill rig that was used at Hasbrouck in 2014. Drill bits of 5.5in diameter were used and samples were extracted through a conventional interchange as a continuous wet slurry on 5ft intervals.

The author has reviewed the data and determined that the 2014 drilling would have no material impact on the Mineral Resource Estimate or proposed open-pit mine design.

10.1.3 COLLAR AND DOWN-HOLE SURVEYS AT THREE HILLS

Early collar locations were estimated from placement on topographic maps. The locations of the 1996 and 1997 drill hole collars, and some earlier drill hole locations, were surveyed in 1996 and 1997 by Haskew Engineering, of Goldfield, Nevada. A Nevada State Plane survey grid was placed over Three Hills in 1996 by Haskew Engineering, of Goldfield, Nevada. Haskew Engineering provided drill hole collar surveys, claim corner surveys, and other location surveys for the remainder of the 1996 and 1997 drill seasons.

The 2012-2013 Allied Nevada drill hole collar locations were surveyed by a Professional Land Surveyor, Haskew Engineering of Goldfield, Nevada. WVM's 2014 drill hole collar locations were initially measured with hand-held Global Positioning System ("GPS"). After completion each hole collar was marked in the field with a brass tag and then surveyed professionally by Haskew Engineering.

No downhole survey records are available for the pre-2012 drilling, nor were any mentioned in the reports. International Directional Services ("IDS") conducted down-hole directional surveys of the majority of the 2012-2013 drill holes using gyroscopic tools. Measurements were reported at 50ft intervals. WVM's 2014 drill holes with depths greater than 300ft were also down-hole surveyed by IDS and directional data were reported at 50ft intervals.

10.1.4 SUMMARY OF DRILLING RESULTS AT THREE HILLS

It is the author's opinion that the drilling and sampling methods used at Three Hills followed industry standard procedures, and are appropriate methods to adequately interpret the geology and mineralized zones. There is a lack of downhole survey data for the pre-2012 drilling, though this risk is mitigated since these holes are generally shallow and most were drilled vertically.

10.2 DRILLING AT HASBROUCK MOUNTAIN

Drilling at Hasbrouck Mountain is summarized in Table 10-3. Drilling contractors and types of drill rigs employed in the 1974 through 2012 historical drill campaigns are summarized in Table 10-4.

Table 10-3 Summary of Drilling in the Vicinity of Hasbrouck Mountain

Year	Company	Area	Holes	Feet
1974 - 1980**	Cordex	Rotary	25	10,629
1985	Franco-Nevada	RC	30	10,156
1988	FMC	RC	76	34,255
1992***	Corona Gold		2	1,210
1996	Euro-Nevada	RC	18	17,670
2010	Allied Nevada	Core	14	7,612.5
2011	Allied Nevada	RC	92	97,163
2011	Allied Nevada	Core	29	20,993.5
2012	Allied Nevada	RC	36	19,930
		Historical Totals	***322***	***219,619***
2014****	West Kirkland	RC	14	4,320
2018****	West Kirkland	RC	1	500
		WVM Totals	***15***	***4,820***

** Includes three holes not in Mineral Resource database due to uncertain locations

*** External to Mineral Resources, not in current Hasbrouck Mineral Resource database

**** Not included in current Mineral Resource Estimate

Table 10-4 Historical Drilling Contractors and Rig Types

from Flint et al. (2012)

Campaign	Contractor	Rig Type
Cordex	Eklund Drilling Company	G.D.15W
	Anaconda Drilling Company	Ingersoll Rand T4
	Unknown	C.P. 650
	Joy Drilling Company	Joy-22
Franco-Nevada	Eklund Drilling Company	TH-60
FMC	Unknown	Unknown
Corona	Brown and Root	D25K truck mount
Euro-Nevada	DeLong Construction and Drilling	Unknown
Allied Nevada	Tonatec Drilling	LF70
	National EWP Drilling	LF90, AC CT14
	Leach Drilling	D40
	Layne Drilling	Explorer 1500

Cordex focused its drilling in the northwest portion of the Hasbrouck Mountain. Drilling was reportedly by rotary methods. From 1974–1980, Cordex drilled a total of 25 rotary drill holes (10,629ft) and one of the 1974 rotary drill holes was deepened using core drilling for an additional 959ft of drilling. The current Mineral Resource database excludes three of the Cordex drill holes, including the deepened core hole, due to uncertain collar locations.

Holes H-1, H-2 and H-3 were drilled dry, without injecting any drilling fluids. Anaconda Drilling Company drilled H-1 and H-2 with an Ingersoll Rand T-4 rig. H-3 was drilled by a second contractor, unknown to RESPEC, who utilized a C.P. 650 rig. The remainder of the program was drilled by Eklund Drilling Company with a G.D.15W rig. Eklund injected water, detergent and other drilling fluids in an attempt to improve sample recoveries from those achieved by previous contractors. Cordex geologists completed fairly detailed geologic logs for each of the drill holes; RESPEC was provided with copies of logs for 21 of the holes.

Franco-Nevada and FMC continued with step-out drilling on Hasbrouck Mountain in the mid-1980s. Franco-Nevada drilled 30 vertical holes within the RESPEC Mineral Resource model extents. The injection of foam and other drilling fluids is occasionally noted on the geologic logs, as is the medium of sample return (wet or dry). Intervals of no recovery are also noted. Eklund Drilling Company was contracted and used a TH-60 drill rig for this program.

RESPEC is not aware of what drilling company or drill rig was used in 1988 FMC program. The F88-series of holes within the Mineral Resource model extents were drilled to infill and expand upon holes drilled by the previous operators, while the T-series holes comprise a closely spaced drill pattern in the western portion of the Mineral Resource model extents. Fourteen of the T-series holes consist of 100-foot holes that were drilled on a 15 x 20 foot grid. The other T-hole lies on the grid and was drilled to a depth of 500ft. A total of 29 of the F88-series holes were angle holes, with angles varying from -45 to -75 degrees. With the exception of two holes drilled to the north, these angle holes were drilled in a southerly direction. The T-series holes were uniformly drilled at -60 degrees due south. The FMC geologic logs for the F88-series of holes are summary in nature, and no comments on drilling methods are included. Intervals where no samples were collected due to lack of recovery are noted, but further specifics on recoveries are lacking. RESPEC was not provided with logs of any type for FMC's T-series of holes.

In 1996, following an 8-year hiatus in exploration, Euro-Nevada focused on drill targets outside of the known Hasbrouck Mineral Resource area and was largely unsuccessful. The 1996 Euro-Nevada program was drilled by DeLong Construction and Drilling, but the type of drill is not known. Angle and vertical holes were drilled to cut various targets along a NW-SE trending belt that passes to the north, east and southeast of Hasbrouck Mountain, so that none of the holes lie within the RESPEC Mineral Resource model extents. The geologic logs do not comment on sample recoveries, presence or absence of groundwater, drilling problems, etc., nor do the Euro-Nevada internal reports in RESPEC's possession.

No historical drill chips are available for inspection. Allied Nevada personnel and geologic consultants working for Allied Nevada, reinterpreted pre-2010 historical drill logs and recorded their reinterpretations in Allied's hand-written logging format. The hand-written reinterpretations were subsequently entered into an Excel spreadsheet. The following are comments on the pre-2010 historical geologic logs as stated by Flint et al. (2012):

- Cordex geologists completed fairly detailed geologic logs for each of the drill holes, and included lithology and alteration details;
- Franco-Nevada drill logs from the 1985 drill program (FN85-series) included lithology and localized alteration recorded primarily in a graphical format with minor associated text. Intervals of no recovery are noted;
- The FMC geologic logs for the F88-series of holes are summary in nature, with minimal geologic and alteration data recorded. No recovery data noted. Logs for the T-series drill holes have not been located;
- Poor-quality photocopies of the geologic logs from the Corona drilling are available; no comments on recoveries or sample quality recorded; and
- Geologic logs from the 1996 Euro-Nevada program denote lithology and alteration, but do not comment on sample recoveries, presence or absence of groundwater, or drilling problems.

RESPEC does not have information on drill bit diameters, drill sample weights, sample recoveries, and specific sampling methods for most of the pre-2010 historical drilling. Ground conditions at Hasbrouck, especially in the upper 300ft of the deposit, present difficult drilling conditions for both RC and core drilling techniques. These problematic ground conditions include clay alteration, highly fractured ground, voids, variable lithology and alteration, existing dump material and faults. As a result, RC and core recovery can be low in the upper portions of the deposit. As noted by Prenn and Gustin (2003, 2006):

- Sample recovery was a continual problem throughout the Cordex drilling program due to the highly fractured nature of the silicified rock;
- Sample recovery problems in the Franco-Nevada program were common, caused by lost circulation, open voids and the necessity of wet sampling due to the injection of water and additives;
- Geologic logs from the FMC drill programs describe intervals where no samples were collected due to lack of recovery; and
- Geologic logs from the Euro-Nevada drill programs do not provide information regarding sample recoveries, wet or dry samples, etc.

Both angled and vertical drill holes were completed. Dips of the drill holes typically range from -90° to -45°, with historical drill holes predominantly drilled at -90°. Drill hole depths ranged from 100 to 1,700ft. Few details are available for logging and sampling procedures used by the various operators from 1974 through 1996. Drill sample intervals varied from 0.5ft to 30ft, but approximately 91% of the assays were done on 5ft intervals. Assays during this period were limited to gold and silver by fire-assay and atomic absorption methods (see Section 11).

10.2.1 DRILLING AT HASBROUCK BY ALLIED NEVADA

In 2010, Allied Nevada completed 14 diamond-core drill holes totaling 7,613ft (Table 10.3). These drill holes were designed to confirm the results of earlier historical drilling and to provide material for metallurgical test work. Allied Nevada initiated a more extensive core and RC drilling program in January 2011. During 2012, Allied Nevada completed 37 reverse circulation holes (20,010ft) focused on the Silver King and Mastif targets, located outside of the main Hasbrouck Mine. Thirty-six of the 2012 RC holes are included in the current Mineral Resource database.

RC drilling was accomplished with standard RC tools utilizing a crossover sub and wet sample collection in the upper portions of the hole. A center return tri-cone drill bit was used for intervals of significant ground water flow. Drill cuttings were collected continuously down the hole, with individual samples taken over 5ft intervals. Samples were submitted for assay, as collected on the rig, with standards, blanks and duplicates inserted into the sample sequence as described below in Section 11. The drill crews sequentially pre-numbered the sample bags, representing the footage interval sampled. The drill crews were provided with 20-slot chip trays, representing 100ft total per tray, and numbered each with hole number, and start and stop footage for the 5ft interval.

According to Wilson (2014) water injection was regulated to minimize the fluid return while maintaining sufficient flow for drilling and sample return. Allied Nevada geologists provided drill crews with 20in x 24in bags. Cuttings were collected as a continuous fraction of the return stream from the drill rig by way of a rotary 36-inch vane splitter. The splitter had vane covers that can be added or removed to provide the desired sample weight for each interval. The cuttings were diverted to a clean, 5-gallon, plastic bucket that contained a small amount of a polymer flocculent. When a bucket was full of water and sample, it was removed and allowed to settle while another bucket was placed under the sample spout. If the drilled material contained clay, more flocculent would be added to the settling bucket and the contents stirred. When the 5ft sample run was complete the last sample bucket was removed, and another clean bucket was placed under the spout. The previous interval buckets were carefully decanted and their contents poured into the 20in x 24in mesh sample bag within another bucket.

During drilling, a strainer was placed under the waste discharge spout to collect chips for the character chip tray and logging purposes. At the end of each run, the drill sampler filled the chip tray slot for the sample interval and discarded the rest. When freezing temperatures were expected the sample bags were placed on plastic sheets to prevent them from freezing to the ground and ripping when picked up. Sample bags were allowed to dry and drain at the drill site, or in a holding area near the sample processing facility.

Filled chip trays were field-checked for numbering accuracy during visits to the drill rig and collected by an Allied Nevada geologist for logging by use of a binocular microscope. Allied Nevada personnel and geologic consultants retained by Allied Nevada, logged all 2010 – 2012 core and reverse circulation drill cuttings on site for geologic and geotechnical parameters. Logs were hand-written and subsequently entered into an Excel spreadsheet. The log sheet was divided into two primary sections: geotechnical and geology. Geological data collected included information on lithology, structure, alteration, metallurgy, and veins.

Logging of alteration and metallurgical characteristics were based on a qualitative scaling of 0 to 3, with 0 denoting absent, 1 for weak, 2 for moderate, and 3 for strong. Basic geotechnical data were collected on each core hole drilled. Each core interval drilled was logged for total core recovery, total fractures, joint condition rating ("JCR"), and sum of all core lengths greater than four inches for rock quality designation ("RQD"). Hardness data were not collected. Core was digitally photographed by ALS Chemex technicians prior to being split for assay. The digital photographs were submitted to Allied Nevada on a series of DVDs.

Procedures used by Allied Nevada for sampling and assaying are given in Section 11. Assays were nearly entirely performed using 5ft samples. All drill samples were analyzed for gold and silver with a combination of fire-assay, atomic absorption and gravimetric methods. In addition, approximately 0.7% of Allied Nevada's drill samples were assayed for Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, and Zn using inductively-coupled plasma-emission and mass spectrometry ("ICP" and "ICP-MS"), with either 4-acid digestion or aqua-regia digestion.

10.2.2 DRILLING AT HASBROUCK BY WEST VAULT MINING

A total of 4,320ft of RC drilling in 14 holes was completed by WVM in 2014, and 500ft from one RC drill hole in 2018. These holes were drilled for condemnation and Mineral Resource expansion purposes and are located south, southeast, and north of the Hasbrouck Mineral Resource.

The author reviewed the data and determined that the 2014 and 2018 drilling would have no material impact on the Mineral Resource Estimate or proposed open-pit mine design.

The drilling was performed by Boart Longyear using a track-mounted MPD 1500 drill rig with 5.5in diameter drill bits. Sample extraction was by conventional interchange with water injection to inhibit dust emissions. Samples were extracted as a continuous slurry on 5ft intervals, and split with a rotating vane wet splitter to approximately 7-8kg. Eight of the RC holes were drilled northeast of the Mineral Resource to test east-west structures identified by surface rock-chip samples with anomalous geochemistry. Mineralization encountered in these holes is external to the Mineral Resource and may be the subject of additional future drilling.

10.2.3 COLLAR AND DOWN-HOLE SURVEYS AT HASBROUCK MOUNTAIN

None of the pre-2010 historical drill-hole collars were originally surveyed. The Cordex and Franco-Nevada collar coordinates are rounded to the nearest 5 or 10ft, suggesting that they are not surveyed locations, and have been based on a drill hole location map constructed by Graney (1985) and subsequently augmented by FMC. The FMC holes are reported to the nearest 0.1ft, but it is not known if these were surveyed locations. In December 2010, Allied Nevada geologists re-established collar locations for as many pre-2010 historical drill holes as possible. Most locations had physical features on the ground (i.e. drill casing) and were marked by stakes and metal tags on the side of the drill road. These sites have also been corroborated by an historical drill collar map. Kevin Haskew, a Professional Land Surveyor with Advanced Surveying & Professional Services in Goldfield, Nevada, subsequently surveyed the collars using the NAD83 datum. Seventy-three pre-2010 historical drill holes were located and surveyed. The pre-2010 and Allied Nevada drill holes were converted to UTM in United States feet, which was used as a local mine grid. From late 2010 to present, Allied Nevada's mine surveyors located drill holes using accurate GPS equipment, reporting directly in UTM coordinates.

All of the Allied Nevada core hole collars were reportedly marked in the field by wooden lath and drill-hole collars were surveyed. The majority of Allied Nevada's holes were surveyed by a Professional Land Surveyor, but some holes were surveyed using handheld GPS devices, and some were located by measuring bearing and distance over short intervals from other surveyed holes.

No down-the-hole survey data were provided to RESPEC for any of the pre-2010 historical drill holes, so that constant dip angles are assumed in the database. This assumption is likely to introduce increasing error with increasing depth of the drill holes. The Euro-Nevada drill holes were apparently down-hole surveyed, but no data are available on survey methods or down-the-hole depths for which the surveys were performed. Eleven of the Allied Nevada core holes drilled in 2010 had down-hole surveys completed. The 2011 and 2012 holes were surveyed except in cases where poor ground conditions or other drilling difficulty prevented entering the hole with the survey tool. Allied Nevada's down-hole surveying was conducted by IDS technicians with gyroscopic tools lowered inside the drill string and projected to total depth when necessary. Measurements were reported at 50ft intervals.

WVM obtained collar locations for their 2014 RC drill holes with an initial measurement by hand-held GPS. After completion, each hole collar was marked with a brass tag; locations were then surveyed by a Professional Land Surveyor (Haskew Engineering). Down-hole directional surveys were performed for holes drilled to depths greater than 300ft. The directional surveys were done by IDS using gyroscopic methods; data were reported at 50ft intervals.

WVM did not survey drill hole collar or down hole survey for 2018 Hasbrouck RC drill hole.

10.2.4 CORE RECOVERY AT HASBROUCK MOUNTAIN

Core recovery data are available for the Allied core drilling completed in 2010 and 2011. RESPEC reviewed the data set and the average core recovery for all Allied drill intervals is 89 percent, while average core recovery for those intervals assaying over 0.006 oz Au/ton is 90 percent. Over 60 percent of the core drilled has a core recovery of 100 percent, with a small percentage at greater than 100 percent, while approximately 7 percent of the total core drilled has recoveries less than 50 percent. The core is generally highly fractured within the mineralized horizons, and RQD measurements are typically low, averaging about 25 percent.

RESPEC checked the core recovery data against the core photos for six Allied core holes and observed that the Allied data recorded in the drill logs for these six core holes over-states core recovery by about 10 percent on average. If this observation holds true for all Allied core holes then average core recovery for the project would be 80-82 percent.

RESPEC analyzed the core recovery data to determine if there was a deposit-wide relationship between poor recovery intervals and changing gold grades. Figure 10-3 shows the average gold grades (blue vertical bars) and the total drill length (light blue line with orange data points) plotted in the vertical axis, while core recovery is plotted along the horizontal axis. The figure includes those mineralized intervals assaying greater than 0.005 oz Au/ton that occur within the current Mineral Resource boundary. The core-recovery data have been separated into distinct bins for each ten percent increase in recovery, for example, the "70" value in the horizontal axis contains all data points which have core recovery values between 70 and 79 percent. All drill intervals with a recorded recovery percentage greater than 110 percent are included in the "110" recovery bin.

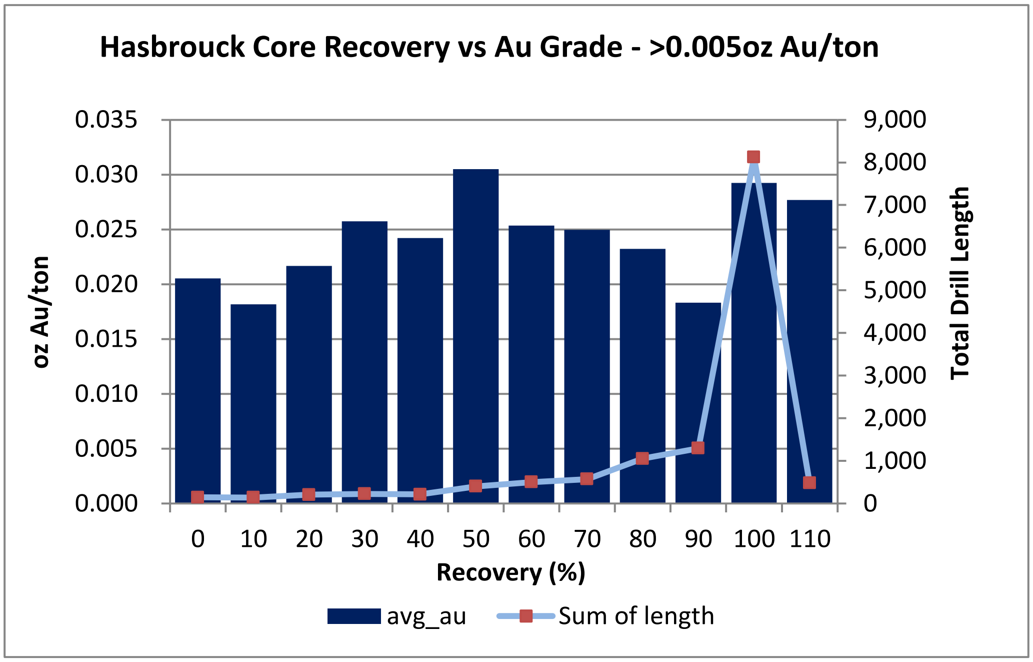

Figure 10-3. Hasbrouck Mine Core Recovery versus Gold Grade

There is a sharp decrease in average gold grade associated with the initial drop in core recovery from 100 percent into the 90 percent range. Below 90 percent recovery, average gold grades gradually increase and then stay fairly level until core recovery drops below 30 percent where gold grades appear to again decrease. The small sample populations at the very low recoveries create some uncertainty in these observations.

Except for the average gold grades observed in the 50 percent recovery bin, core recovery loss is associated with a decrease in average gold grades. The sharp decrease in gold grade observed with just a small decrease in core recovery (from 100 percent to 90-99 percent core recovery) is likely due to the preferential loss of the gold-bearing fine and /or fracture-fill material occurring within silica veinlets cutting weakly mineralized wall rock. At lower core recoveries, both the fracture-fill material and the wall rock suffer core loss so average gold grades will increase as indicated in Figure 10.3.

These results indicate that the gold assay values used in the Mineral Resource Estimate are potentially skewed low for those core intervals with less than 100 percent core recovery. This lends a conservative aspect to the current Mineral Resource.

10.2.5 SUMMARY OF DRILLING RESULTS AT HASBROUCK MOUNTAIN

It is the author's opinion that the drilling and sampling methods used at Hasbrouck followed industry standard procedures, and are appropriate methods to adequately interpret the geology and mineralized zones. There is a lack of downhole survey data for the pre-2010 drilling, though this risk is mitigated because these holes are generally shallow and were drilled vertically. Core recovery analyses indicates that the gold assay values used in the Mineral Resource Estimate are potentially skewed low for those core intervals with less than 100 percent core recovery. This lends a conservative aspect to the current Mineral Resource Estimate.

10.3 DRILLING AT HILL OF GOLD

There are 102 drill holes representing 27,124ft of drilling in the Hill of Gold database. RESPEC has little or no information on the drilling and sampling contractors, equipment and methods and procedures used by the historical operators. Six core holes were drilled in 1996 for 1,985ft of drilling and 83 were RC drill holes for 27,941ft of drilling. Eastfield drilled the core holes for metallurgical test work in 1996.

WVM drilled one RC hole in 2017 and two RC holes in 2018, to expand the 1996 Historical Estimate area to the north and west. Drilling and sample collection was under the supervision of Scott Tregaskis. The drilling was performed by Boart Longyear using a track-mounted MPD 1500 drill rig with 5.5in diameter drill bits. Sample extraction was by conventional interchange with water injection to inhibit dust emissions. Samples were extracted as a continuous slurry on 5ft intervals, and split with a rotating vane wet splitter to approximately 15-18lb. WVM 2017 and 2018 Hill of Gold RC drill holes were not surveyed for drill hole collar or down hole survey.

Table 10-5. Historical Drilling at Hill of Gold

Year	Company	Type	Holes	Feet
1974 - 1985*	Cordex	Unknown	10	867.8
1982 - 1985	Crown Resources	Unknown	57	12,126
1988*	Phelps Dodge	RC	16	6,640
1996	Eastfield	RC	13	5,505
1996	Eastfield	Core	6	1,985
		Historical Totals	102	27,123.8
2017	West Kirkland	RC	1	500
2018	West Kirkland	RC	2	785
		WVM Totals	3	1,285

* Includes holes not in Historical Estimate database due to uncertain depths

The histories of the drilling campaigns were discussed in reports by S.W. Tregaskis, and G.L. Garratt. The locations of the 1996 drill hole collars and some earlier drill hole locations were surveyed in 1996 by Haskew Engineering, of Goldfield, Nevada. The author is unaware of the methods and procedures used for surveying of the collar coordinates and for down-hole deviation. Some holes from early campaigns were not accurately located and several holes were located from poor quality maps.

11.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY

11.1 HISTORICAL SAMPLE PREPARATION, ANALYSES

This section is modified from Dyer et al. (2016). Information on the historical sample preparation, analytical laboratories and methods, as available, is summarized from Prenn and Gustin (2003, 2006); Prenn (2003, 2006, and sources therein), Flint et al. (2012) and Wilson (2014).

11.1.1 THREE HILLS SURFACE SAMPLES

1974-1997:

RESPEC is not aware of records describing the sample collection procedures, sample preparation and assay methods used for surface sampling conducted by Cordex, Saga, Echo Bay, and Eastfield. Prenn (2006) reported that the geochemical analysis of gold, silver, arsenic, antimony, mercury, molybdenum, and occasionally copper, lead, and zinc was completed for the property, and that approximately 550 rock samples were collected in 1996-1997 by Rodney Thompson for a Master's Thesis at Colorado School of Mines. RESPEC has no information about the sampling and preparation procedures, and the assay types or methods utilized.

2012-2013:

Sparse records indicate that Allied Nevada's surface samples were assayed by ALS Chemex, using fire-assay with atomic absorption finish for gold, and gravimetric finish for silver, as well as ICP-AES determinations for 35 major, minor and trace elements with aqua-regia digestion. Samples were crushed to < 2mm, and a 1kg split was pulverized to 85% at < 75 microns. Information is not available to RESPEC regarding sample collection procedures, or the use of standard, blank or duplicate samples.

11.1.2 HASBROUCK SURFACE AND UNDERGROUND SAMPLES

1974-1996:

RESPEC knows very little of the sampling methods, sample preparation procedures and details of assay techniques employed on any of the programs undertaken at Hasbrouck prior to 2010. In 1980, Cordex sampled the Main, Ore Car, South, and Northeast adit underground workings. No details of the underground sampling program of Cordex are available to RESPEC, including sample size, exact sampling procedures employed, assay laboratory used, etc. Also not available to RESPEC, and possibly these no longer exist, are records documenting the sampling procedures, sample preparation and assay methods used for surface samples collected by Franco-Nevada, FMC and Corona during the 1980's. Surface rock samples collected by Euro-Nevada in the 1990's were largely analyzed by ALS Chemex with fire assay methods for gold, and ICP-AES methods for 32 elements, including silver. Details of Euro-Nevada's sampling procedures, sample preparation, and sample digestion are not available.

2010-2013:

Allied Nevada personnel collected 667 channel samples from selected road cuts (Flint et al., 2012). The samples were analyzed by ICP methods with 4-acid digestion at ALS Chemex for gold, silver, and as many as 34 major, minor and trace elements. RESPEC has no information on procedures used for the sample collection and sample preparation. QA/QC standards, blanks and/or duplicate samples were not inserted.

11.1.3 THREE HILLS DRILLING SAMPLES

1974-1997:

Laboratory and sample preparation procedures prior to the mid 1990's are unknown. Notes on drill logs from 1974 indicate that Union Assay Laboratories ("Union"; Denver), Rocky Mountain Geochemical Laboratories ("Rocky Mountain"; Reno), Humboldt Laboratory ("Humboldt"; location unknown), and Skyline Laboratory ("Skyline"; Tucson) were used, presumably for fire assays. Gold assays prior to 1996 appear to have been completed using a fire assay method, as indicated on some drill hole logs and on one assay sheet. Silver, when assayed for, was determined using atomic absorption methods with a lower detection limit of 0.2 ppm. RESPEC has no information about sample preparation procedures, or the use of standard, blank and duplicate samples. The 1988 drilling samples may have been assayed in Gexa's mine lab near Beatty, Nevada.

During 1996 and 1997 drilling samples were analyzed at the Chemex Laboratory, Reno Nevada. The preparation was a 0 to 3kg primary crush, then ring pulverization to <150 mesh. In 1996 and 1997 gold was determined by fire assays done with a 30g charge and atomic absorption finish. The lower detection limit was 5 ppb, with an upper limit of 10,000 ppb. Over limit results were re-assayed using a fire assay with gravimetric finish. Cold-cyanide, shake-leach gold analyses were completed on selected 1996 drill hole samples. RESPEC does not have information on the use of standard, blank and duplicate samples utilized in the 1996-1997 drilling at Three Hills.

2012-2013:

Allied Nevada's drilling samples during 2012-2013 were prepared and assayed by ALS Minerals Laboratories ("ALS", Reno, Nevada; formerly ALS Chemex) in Reno, Nevada. RC drilling samples were crushed to 70% passing 2mm, and a 1kg split was pulverized to 85% passing 75µm. Core samples were logged, and sample intervals were marked by Allied Nevada geologists prior to shipping the whole core to ALS in Reno, Nevada. The core was ½ sawn by laboratory personnel at the ALS laboratory facilities. According to Flint et al. (2012), Allied Nevada geologists marked the core with cutting guidelines to best divide the core in a representative manner where veins were visible. Otherwise, core was reportedly sawed perpendicular to bedding.

Gold was determined by cyanide leach and by fire assay with atomic absorption finish on 30g sub-samples. The lower detection limit was 0.005 ppm. In cases of gold "over limits" (> 0.29167 ounces per ton (opt)), the fire assay was repeated using a gravimetric finish. Silver was determined by atomic absorption after 4-acid digestion of a 0.5g sub-sample. The lower detection limit for silver was 0.5 ppm. In cases of silver > 29.167 opt, silver was re-analyzed using a gravimetric finish.

Allied Nevada inserted standards into the RC sample stream at 80ft intervals prior to shipment to the assay laboratories. Pulped quartz blanks were inserted at variable intervals with the core samples. RESPEC has no information on blanks that may, or may not, have been inserted with the RC samples (see details in Section 12).

2014:

RESPEC has not compiled and evaluated the QA/QC data for the 2014 drilling because the holes are not material to and are not included in the current Mineral Resource database.

11.1.4 HASBROUCK DRILLING SAMPLES

1974-1996:

Information on sample preparation and analytical procedures for drill samples prior to 2010 is very limited, and nothing is known of the use of standard, blank and duplicate QA/QC samples during this period. The Cordex RC drill hole assays were handwritten in the margin of the drill logs. During the 1970's, when Cordex operated the property, this was a common practice for Nevada projects. Cordex gold and silver assays were performed by Union; Denver, Rocky Mountain; Reno, Humboldt; location unknown, and Skyline; Tucson and were recorded in ounce per ton units. The assay method is presumed to be fire assay (fusion). The sample preparation and assay methodology used were not recorded in the information provided. Prenn and Gustin (2006) noted that the Union detection limits on all Cordex holes except for H-24, were 0.005 opt Au and 0.10 opt Au. Drill hole H-24 had a detection limit of 0.003 opt Au.

Franco-Nevada's drill sample assays were performed by Rocky Mountain. Sample preparation and assay methodology are not documented. RESPEC noted that the Rocky Mountain assays were performed as one-assay-ton fire assays, with detection limits of 0.005 opt Au and 0.10 opt Au; copies of the original assay certificates were provided to RESPEC (Prenn and Gustin 2006). Prenn and Gustin (2003, 2006) reported that Bechtel was contracted by Franco-Nevada to monitor the drilling, sampling, assaying and metallurgical test work, to ensure that the data collection "met the requirements for the preparation of a pre-feasibility study".

The FMC reverse circulation samples were analyzed by Intermountain Analytical by two-assay-ton fire assay and were hand-written in the margins of the lithology logs. Detection limits were 0.005 opt Au and 0.05 opt Ag (Prenn and Gustin 2003, 2006). The only available information on the Corona analytical methods is reported in Prenn and Gustin (2003, 2006). The Corona RC samples were analyzed by Barringer Laboratories, Inc. ("Barringer") for which copies of the original assay certificates have been provided to RESPEC. RESPEC observed that in contrast to the previous programs, which restricted the elements analyzed to gold and silver, Barringer analyzed gold by fire assay with an atomic absorption finish, and silver and molybdenum by atomic absorption. Detection limits were 2 ppb for gold, 0.1 ppm for silver and 1 ppm for molybdenum.

Chemex Labs Inc. ("Chemex"; location unknown) assayed the Euro-Nevada RC samples (Prenn and Gustin 2003, 2006). Gold analyses were by fire assay and atomic absorption finish, with a detection limit of 5 ppb. Silver was analyzed by atomic absorption, using an aqua regia digestion, with a detection limit of 0.2 ppm silver. Wilson (2014) reported that Quality Control data exist for the Euro-Nevada drilling program, but RESPEC did not review these data because these holes are external to the Hasbrouck Mineral Resource area.

2010-2013:

Core samples were logged and sample intervals were marked by Allied Nevada geologists prior to shipping the whole core to ALS. According to Flint et al. (2012), geologists marked the core with cutting guide lines to best divide the core in a representative manner where veins were visible. The core was ½ sawn by laboratory personnel at the ALS laboratory facilities. As stated by Flint et al. (2012), "*samples are prepared from a split of 70% passing -3 mesh if pieces are too large to fit in the pulverizer, and further crushing of 70% pass–ng - 10 mesh. A 2.2 pound split is taken and pulverized to 85% pass–ng - 200 mesh*."

Allied Nevada's RC drilling samples were prepared and analyzed at ALS in Reno, Nevada, and at Inspectorate Labs, Sparks, Nevada. ALS and Inspectorate Labs are ISO 9001:2000 registered laboratories. Samples were crushed to 70% passing 2 mm, and a 1kg split was pulverized to 85% passing 75µm.

Gold was determined by fire assay and atomic absorption finish on 30g sub-samples. The lower detection limit was 0.005 ppm. In cases of gold "over limits" (> 0.29167 ounces per ton or > 10 g/t), the fire assay was repeated using a gravimetric finish. Silver was determined by atomic absorption after 4-acid digestion of a 0.5 g sub-sample. The lower detection limit for silver was 0.5

ppm. In cases of silver > 29.167 opt, silver was re-analyzed using a gravimetric finish. During the last half of 2011, additional silver analyses by fire assay gravimetric methods were employed in the program. "Screen fire analyses" were completed for select high grade gold holes (HSB11-019, HSB10-001).

Gold and silver cyanide-leach assays were determined on select samples in 2010, and on most gold samples in 2011. The laboratory method used a 30g charge, subjected to a cyanide leach cycle including agitation for one hour. The solutions were then analyzed on an Atomic Absorption Spectrometer. The lower level of detection for silver was 0.5 ppm, and the gold lower detection limit was 0.03 ppm.

A small percentage of Allied Nevada's drill samples in 2010 and 2011 were also assayed by ALS using ICP-AES methods to determine 35 major, minor and trace elements with a 4-acid digestion.

A review of assay certificates indicates Allied Nevada inserted blanks as the initial sample for RC holes and then at approximately every 20 to 40 samples, without a fixed frequency. Standards were inserted into the RC sample stream every 18 to 20 samples, but not in all holes, prior to shipment to the assay laboratories. Duplicates were included at intervals of approximately every 20 samples, but not for all holes (see details in Section 12).

2014 and 2018:

RESPEC has not compiled and evaluated the QA/QC data for the 2014 and 2018 drilling because the holes are not material to and are not included in current Mineral Resource database.

11.1.5 HILL OF GOLD DRILLING SAMPLES

1974 - 1985

Mr. Bickel is unaware of any information on the methods and procedures used by historical operators for the preparation of the 1974-1985 Hill of Gold drilling samples.

1988

Mr. Bickel is unaware of any information on the methods and procedures used by historical operators for the preparation of the 1988 Hill of Gold drilling samples.

1996

Eastfield assay data gathered during 1996 was obtained directly from the assay lab, Chemex. Mr. Bickel is unaware of any additional information on the methods and procedures used by historical operators for the preparation of the 1996 Hill of Gold drilling samples. According to historical reports by MDA, twenty check assays were completed for coarse rejects from the Eastfield drilling campaign of 1996. The samples were selected from coarse drill hole rejects by Eastfield personnel and sent to a third-party lab by MDA. The correlation between the two data sets was determined to be good, with a correlation coefficient of .932, although the check assay set had a much lower mean than the original assay set (about a 20% difference). There were two anomalous samples that influenced the comparison significantly. If these two samples are removed the resulting comparison improves a great deal, with a difference in means of about 6%.

2017 and 2018:

RESPEC has not compiled and evaluated the QA/QC data for the 2017 and 2018 drilling because the holes are not material to and are not included in historical resource database.

11.2 SAMPLE PREPARATION AND ANALYSIS BY WEST VAULT MINING

11.2.1 SURFACE SAMPLING BY WEST VAULT MINING AT THREE HILLS AND HASBROUCK

Rock-chip samples collected at Three Hills and Hasbrouck were all prepared and analyzed at ALS in Reno, Nevada. Samples were crushed in their entirety to 70% at <2mm, then riffle split to obtain a 250g subsample. The 250g subsamples were pulverized to at least 85% at <75 microns. Gold was determined by fire-assay on 30g charges with ICP-AES finish. The lower detection limit for gold was 1ppb. Silver and 47 major, minor and trace elements were analyzed with ICP-AES-MS methods using 4-acid digestion. ALS is a commercial laboratory with ISO certifications and is independent of WVM.

WVM did not insert blanks and standard samples into the sample stream for rock-chip samples taken at Three Hills and Hasbrouck.

11.2.2 WEST VAULT MINING'S DRILL SAMPLES AT THREE HILLS AND HASBROUCK

Core samples were logged and sample intervals of approximately 4in to 5ft lengths were marked by WVM geologists prior to shipment of the whole core to ALS in Reno, Nevada. The core was ½ sawn by laboratory personnel at the ALS laboratory facilities. Sample intervals of ½ core were crushed in their entirety to 70% at <2mm, then riffle split to obtain a 250g subsample. The 250g subsamples were pulverized to at least 85% at <75 microns. Gold was determined by fire-assay on 30g charges with ICP-AES finish. The lower detection limit for gold was 1ppb. Samples assayed at >1 g/t gold were re-assayed with atomic absorption finish. Silver and 47 major, minor and trace elements were analyzed with ICP-AES-MS methods using 4-acid digestion.

WVM's RC samples were split at the drill rig to approximately 17 to 20lb samples for shipment to ALS in Reno, Nevada. After drying, the RC samples were crushed in their entirety to 70% at <2mm, then riffle split to obtain a 250g subsample. The 250g subsamples were pulverized to at least 85% at <75 microns. Gold was determined by fire-assay on 30g charges with ICP-AES finish. The lower detection limit for gold was 1ppb. Samples assayed at >1 g/t gold were re-assayed with atomic absorption finish. Silver and 47 major, minor and trace elements were analyzed with ICP-AES-MS methods using 4-acid digestion.

For both core and RC drilling, WVM inserted blank, standard and duplicate samples into the drill sample stream at regular intervals. Details are given in Section 11.5.

WVM drill sampling methods for Hill of Gold were the same as above.

11.3 SAMPLE SECURITY

No information is available for sample security procedures used during drilling from 1974 through 1997 at Three Hills and Hasbrouck mines. During 2010 through 2013 Allied Nevada personnel transported drill core on a daily basis from drill sites at Three Hills and Hasbrouck to the Allied Nevada logging facility in Tonopah, Nevada (Wilson, 2014). RC samples were retrieved from the drill rig and stored in sample bins or on pallets. Personnel and vehicles dispatched from the assay laboratories travelled to the logging facility and picked up the samples. Sample identification numbers and missing samples were verified by the site geologists prior to release of the samples to the assay lab personnel.

During 2014, 2017 and 2018, sample security was maintained by WVM in the following manner:

- Core samples drilled at Three Hills were under the continuous supervision of WVM's geologists at the drill sites, and were then transported by WVM personnel to WVM's secure facility in Tonopah, Nevada. ALS personnel travelled to Tonopah, took custody of the samples from WVM personnel, and transported the samples to the ALS laboratory in Reno, Nevada.
- RC drilling took place on a day-shift only basis. RC samples were transported daily by WVM personnel to either a locked storage container, or WVM's fenced storage area in Tonopah. Samples were not left at the drill rig unattended during the night. ALS personnel travelled to Tonopah, took custody of the samples from WVM personnel, and transported the samples to the ALS laboratory in Reno, Nevada.

11.4 SUMMARY STATEMENT ON SAMPLING, ANALYSIS AND SECURITY

It is Mr. Bickel's opinion that the sampling, assaying, and security procedures used at Three Hills and Hasbrouck mines, to the extent known, followed industry standard procedures, and are adequate for the estimation of the current Mineral Resources. For certain historical drilling and sampling campaigns, little is known about these procedures. It is the opinion of Mr. Bickel that in these cases, the preparation and analyses were performed by reputable companies and laboratories and likely followed good practices. At Hill of Gold, little is known to the author regarding the historical procedures for sampling, assaying, and security. However, the author has not estimated Mineral Resources at Hill of Gold and therefore the lack of historical information is immaterial to the Mineral Resources reported herein.

11.5 QUALITY ASSURANCE/QUALITY CONTROL

Historical pre-2010 Programs:

No quality control documentation has been found for the Cordex, Franco-Nevada, and FMC Hasbrouck drill campaigns, other than for check assays (see Section 12.5.4, below). Based upon the era of drilling for these campaigns (1974 to 1988) it is not unusual that no QA/QC program was employed. Quality control data exist for the Euro- Nevada drill holes, but because the Euro-Nevada drill holes were drilled outside the Hasbrouck Mineral Resource area, these data have not been evaluated.

Allied Nevada 2010 – 2013:

Allied Nevada utilized standards, duplicates and check assays to evaluate the analytical accuracy and precision of the assay laboratory during the time the drill samples are analyzed. At both Three Hills and Hasbrouck mines, Allied Nevada submitted certified reference materials ("CRM"s) and blank samples in the project sample stream to monitor assay accuracy and possible contamination during sample preparation. The CRMs were obtained from Minerals Exploration and Environmental Geochemistry of Reno, Nevada ("MEG") and had a range of gold and silver grades that were within the expected grade range for the deposit samples as summarized in Table 11-1. Data available to RESPEC indicate that duplicates were inserted with samples from 39 RC holes and one core hole drilled in 2011 at the Hasbrouck Mine. RESPEC has no information on what types of duplicates were inserted, or how the duplicates were collected. Therefore, Mr. Bickel has not evaluated these duplicate data.

Table 11-1. Summary of QA/QC Reference Materials for the Allied Nevada Drilling at Three Hills and Hasbrouck Mines

StandardID	Source	Certified Gold Value PPM	1SD PPM
A607003X	MEG	0.734	0.059
Cove 1	MEG	0.473	0.069
Cove 2	MEG	0.663	0.126
Cove 3	MEG	0.852	0.059
Cove 4	MEG	2.044	0.134
Cove 10	MEG	0.437	0.026
Cove 11	MEG	0.484	0.041
Cove 12	MEG	0.418	0.035
MEG-Au-09.01	MEG	0.687	0.073
MEG-Au-09.03	MEG	2.09	0.331
MEG-Au-09.04	MEG	3.397	0.407
S105003X	MEG	0.525	0.075
S107001X	MEG	0.234	0.016
S107005X	MEG	2.416	0.526
S107011X	MEG	9.262	0.868
S107020X	MEG	0.32	0.068

West Vault Mining 2014 - 2018

WVM's 2014 QA/QC program utilized blanks, standards and duplicate samples inserted with core and RC samples prior to shipment to ALS. These were inserted on a regular basis as shown in Table 11-2.

Table 11-2. WVM QA/QC Sample Insertion Template

Position in Sample Sequence	QA/ QC Sample Type
12	Blank
18	Standard 1
24	Duplicate
38	Duplicate
42	Blank
52	Standard 2
67	Blank

Position in Sample Sequence	QA/ QC Sample Type
70	Duplicate
91	Standard 1
94	Standard 2
112	Blank
Repeat as above	

The author has not evaluated the WVM QA/QC data since these drill data are not included within the current Mineral Resource Estimate. The same is true for WVM drilling in 2017 and 2018 at Hill of Gold and the 2018 holes drilled at the Hasbrouck Mine.

11.5.1 THREE HILLS STANDARDS

Allied Nevada inserted CRM's obtained from MEG into the drilling sample stream prior to shipment of samples to the laboratory. CRM's were inserted at 80ft intervals in the RC sample stream, and at variable intervals of 80ft to 220ft in the core sample stream. Records indicate a total of 122 CRM's were inserted, 15 of which accompanied core samples in 2013. RESPEC has no assay results for the CRM's inserted with the 2013 core samples, and only gold assays for the 107 CRM's inserted with RC samples. The effective insertion rate for standards used by Allied at Three Hills is therefore 4%. A total of 13 CRM's returned gold values more than 2 standard deviations from the recommended average value. One of these corresponds well to the average value for a different CRM and may have been mislabeled. The remaining 12 failures represent a failure rate of 0.4% and were equally divided outside the upper and lower control limits.

Results for WVM's standards used in the 2014 drilling program at Three Hills have not been evaluated by the author because the 2014 drill holes are not included in the current Mineral Resource Estimate.

11.5.2 HASBROUCK STANDARDS

Data available to RESPEC indicate that Allied Nevada inserted a total of 1,063 CRM's, or standards, into the sample stream for RC and core drilling at Hasbrouck Mountain during 2010, 2011 and 2012. Of these, 1,049 fire-assay atomic absorption results for gold, and 425 results for silver by atomic absorption are available, corresponding to 4.6% of Allied's drill hole gold assays and 1.9% of Allied's drill hole silver assays. The CRM's were inserted at roughly eighty foot intervals, in conjunction with quartz pulp blanks. According to Wilson (2014), in the original overall Allied Nevada assay data set, thirty-two standards were mistakenly given a "Quartz" sample designation. The standard labels contained the correct standard name, and were hand notated with the Quartz designator. The values returned clearly represented the values for the standard printed on the label. The sample standard designator was corrected, and the standards placed in the standards analysis data set.

Two cases were documented, and several additional cases were suspected, where the standard and quartz material, which were submitted together, were mixed together at the lab before analysis. The suspected cases were included in the standards failure statistics of Wilson (2014), who noted two cases in which the standard and quartz data had been swapped. Wilson reported these were corrected and data assigned to the proper data set.

Wilson (2014) reported a failure rate of 6.3% of the Allied Nevada CRM gold assays (greater than 2 standard deviations difference from the CRM recommended average value), but noted that the majority of the failures were within 5% of the over and under limits. The author's review of the CRM gold data found no significant difference from that of Wilson (2014). Fifteen different, but in some cases, similarly named, CRM's were used. More than half of the failures had gold results that correspond well with other CRM's used in the program. The author suspects, but cannot demonstrate, that the majority of the failures are likely due to mislabeling or incorrectly entering the CRM names prior to shipment of samples to the laboratory.

Mr. Bickel has not evaluated the 425 assays of CRM's for silver. The quantity of silver QA-QC control samples would appear to be a small. However, silver accounts for such a minor value in the estimated Mineral Resource that the author does not consider silver to be material to the estimate.

11.5.3 THREE HILLS BLANKS

Records indicate that Allied Nevada inserted one or two quartz pulp blanks per hole with samples from the 2013 core drilling. However, RESPEC does not have the results, and notes that pulp blanks are not useful for monitoring contamination that could possibly occur during the crushing and pulverizing stages of the sample preparation.

11.5.4 HASBROUCK BLANKS

Two types of blank samples were inserted in the Hasbrouck Mountain drill sample stream by Allied Nevada to monitor possible contamination: 1) blanks described as crushed landscaping granite, and 2) quartz pulps supplied by MEG. The crushed granite blanks were inserted at the start of each sample run to monitor possible contamination during sample preparation (Wilson, 2014). RESPEC has assay results for 63 crushed granite blanks. Allied Nevada also inserted 345 quartz pulp blanks from MEG at approximately 80ft intervals, for which RESPEC has assay results for 227 cases. The total insertion rate for which RESPEC has gold assay results is 1.3% of Allied Nevada's Hasbrouck drilling samples. The author considers the number of blanks to be on the low side, particularly because 78% were submitted as pulps and as such, do not monitor possible contamination during crushing and pulverizing.

RESPEC has no quantitative data on the expected gold concentration of the particular crushed granite used, but in the author's experience such material typically contains less than 0.005g Au/t, which is the lower detection limit of the assay method. Values less than three times the lower detection limit is generally considered to be within the analytical uncertainty. Of the inserted granite blanks 16% assayed greater than 0.015g Au/t, and 7.9% assayed ≥0.050g Au/t. The two highest failures were inserted as two successive samples in hole HSB11-30 and returned 0.376 and 0.282g Au/t. These values correspond well with two different standards used by Allied Nevada. It is possible that these two significant failures could have been mislabeled standards, but the author cannot exclude the possibility of some contamination in HSB11-30. If contamination has occurred in HSB11-30, it is not material on a deposit scale.

11.5.5 HISTORICAL CHECK ASSAYS - THREE HILLS MINE

At Three Hills Mine, Prenn (2003 and 2006) reviewed the data and determined that the correlation between check assays and samples from earlier drilling programs indicated no significant bias. No historical samples are available for re-assay. A total of 100 metallic screen assays were also completed. The average grade of these agreed closely with the original sample average grade, with the metallic assays being 3% lower on the average.

11.5.6 HISTORICAL CHECK ASSAYS – HASBROUCK MINE

At the Hasbrouck Mine, Cordex sent 342 out of the total of 935 original Union Assay rotary drilling samples to Rocky Mountain Geochemical for check assays. Almost 75% of the original results that were equal to or greater than 0.025 oz Au/ton were checked. The author does not know whether pulps, rejects or sample splits were analyzed in the check assays. As reported by

Prenn and Gustin (2006) the original Union gold assays compare well with the Rocky Mountain check analyses at values up to 0.05 oz Au/ton. Union Assay values greater than 0.05 oz Au/ton, however, tended to be higher than the Rocky Mountain check assays. The Union silver assays were systematically higher than the Rocky Mountain check analyses.

The most complete check assay data available from the Cordex drilling program is for hole H-24. This was also the only Cordex hole that was sampled at 5-foot intervals. The Rocky Mountain check assays for H-24 are systematically lower than the Legend checks for both gold and silver. The Rocky Mountain and Legend analyses were performed on the same pulps. Legend and Union results compare well for both gold and silver, while the Rocky Mountain-Union comparisons for gold and silver in hole H-24 are fair, based on the limited data (Prenn and Gustin, 2006).

The systematic discrepancy in silver analyses between the primary Cordex assay lab, Union Assay, and the primary check assay lab, Rocky Mountain Geochemical, is a concern. Based on the limited H-24 check assay data, the Legend results support the original Union analyses. The apparent bias of Union Assay to higher gold values compared to Rocky Mountain at values greater than 0.05 oz Au/ton is also a concern. Legend H-24 check assays are systematically lower than Rocky Mountain, which again supports the original Union assays.

Franco-Nevada check assays were performed by Rocky Mountain Geochemical, who also performed the original assays. The author does not know if the checks were done on the original pulps, rejects or sample duplicates. The gold checks compare well with the original assays, although the means differ significantly (0.039 oz Au/ton for the checks versus 0.031 oz Au/ton for the originals). If one outlier sample is removed, however, the mean of the check assays lowers to 0.034 oz Au/ton, while the original mean remains unchanged. The silver assays also compare well, with most of the variation occurring in original assays between 0 and 0.5 oz Ag/ton.

Bechtel (1986) reported that Chemex Labs Ltd performed check assays on 50 rejects of the original Rocky Mountain samples for Franco-Nevada. The check assays averaged 0.037 oz Au/ton, compared to the original Rocky Mountain average of 0.040 oz Au/ton. Bechtel concluded that there was no significant bias in the assay data, and therefore considered the original Franco-Nevada assays to be reliable. RESPEC does not have the Chemex check assay data to review.

FMC drill cuttings were assayed for gold and silver by Intermountain Analytical using two-assay-ton fire assay (Cofer, 1989). Five-foot check samples were taken every 50ft and sent to Bondar-Clegg for gold plus 17 element analyses. The results of these check samples are not known to the author.

RESPEC lacks check assay data for the Cordex T-series holes and underground sampling, as well as the Corona and Euro-Nevada reverse circulation drilling programs.

Wilson (2012) reported that Allied Nevada obtained check assays for the 2010-2011 drilling at the Hasbrouck Mine. RESPEC does not have the check assay data, but Wilson (2012) concluded:

> "*In the Author's opinion the gold and silver assays from the 2010-2011 drilling campaign are acceptably accurate for use in Mineral Resource estimation. For the 2012 drill campaign, no check assays were completed at Hasbrouck, as the drilling was exploratory in nature and did not encounter large zones of mineralization.*"

11.5.7 RESPEC CHECK ASSAYS - THREE HILLS

As part of the current study, and to bolster the existing Three Hills QA/QC data set, RESPEC collected 32 core-twin check samples from the 2013 Three Hills Allied core holes that are currently in storage. These samples consisted of the remaining half-core left after the initial sampling. The samples were sent to ALS in Reno, NV, and analyzed using the same fire assay methods as the original sampling/assaying program. The original assays averaged 0.081oz Au/ton while the check assays averaged 0.084oz Au/ton indicating no significant bias in the full data set. If the four highest grade sample pairs (>0.15oz Au/ton) are removed from the data set, there is an average 15% high bias in the check samples.

These results suggest that the Allied core hole gold assay values used in the Mineral Resource Estimate are potentially skewed low and therefore lends a conservative aspect to the current Mineral Resource.

11.5.8 HILL OF GOLD DRILLING SAMPLES

Mr. Bickel is not aware of the historical QA/QC procedures at Hill of Gold. Since there are no estimated Mineral Resources for the project reported herein, the lack of historical information related to QA/QC is not a concern to the author.

WVM inserted standards and blanks into the 2017-2018 drilling assay stream and had a strict chain of custody, by combining samples into secure rice-bags and driving the samples directly to ALS sample prep facility in Reno.

11.6 SUMMARY STATEMENT ON QUALITY ASSURANCE/QUALITY CONTROL

The author has reviewed the available QA/QC data and the assessments of that data made by Wilson (2014) and references therein, including Prenn (2003) and Prenn and Gustin (2003, 2006). The author agrees with the conclusions of these preceding studies and considers the assay data to be adequate for the estimation of the current Three Hills and Hasbrouck Mineral Resources.

12.0 DATA VERIFICATION

According to NI 43-101, Data Verification means the process of confirming that data have been generated with proper procedures, have been accurately transcribed from the original source and are suitable for use in this report. This section is modified from Dyer et al. (2016). The author has conducted an audit of Three Hills and Hasbrouck databases and compiled and analyzed available QA/QC data collected by Allied. No QA/QC data are available for pre-Allied drilling conducted before 2010.

12.1 DRILLING DATABASE AUDIT

Three Hills and Hasbrouck databases provided to RESPEC by WVM contain the same data as used in the previous 2016 Mineral Resource Estimate (Dyer et al., 2016). For the current Mineral Resource Estimate, the author completed a full audit of the Allied 2010-2013 drill data at Three Hills and Hasbrouck (196 drill holes), comparing these data against original survey notes and assay certificates. The pre-Allied data were previously audited by Prenn (2003) and Prenn and Gustin (2006) and the current database was compared against both these historical databases along with data compiled in 2010 by Allied.

Data from the 2014, 2017, and 2018 drilling at Hasbrouck, and the 2014 drilling at Three Hills, were brought into the project database and evaluated in relation to the rest of the database and various three-dimensional models. The data were not audited as they did not contribute to the Mineral Resource Estimate.

12.1.1 AUDIT OF PRE-ALLIED DATA

The pre-Allied analytical and geological (drill log) data was previously verified by Prenn and Gustin (2006) and Prenn (2006) for the Three Hills and Hasbrouck mines, respectively. For the current Mineral Resource Estimate, the author compared the 2006 audited data, along with data compiled by Allied, against the databases provided by WVM as summarized below.

12.1.1.1 PRE-ALLIED DRILLING DATA FOR THREE HILLS

Collar Locations:

There are no discrepancies between the WVM collar data and the previous databases.

The location of TH-13 is in question due to significant differences in the assay values and logged geology as compared with the adjacent drill holes. TH-13 remains in the database, but the assays were excluded from use in the Mineral Resource Estimate.

After reviewing additional historical data provided by Allied, the location of TH-01 was revised to reflect original survey data and locations noted on two plan maps.

The final drill depths for 17 drill holes were changed to reflect the current assay and geology data.

Downhole Survey:

No discrepancies were noted in the downhole survey data between data sets. None of the pre-Allied drill holes were surveyed.

Assays:

Eighteen assays were corrected in Three Hills assay data received from WVM; 13 of which are considered significant (>0.004 oz Au/ton difference). The "less than detection" assays were also standardized as "0" within the current database, while over 700 sample intervals noted as "no sample" in the WVM database are actually less than detection values, and therefore have been changed to "0" in the current database.

12.1.1.2 PRE-ALLIED DRILLING DATA FOR HASBROUCK

Collar Locations:

None of the pre-2010 drill-hole collars were originally surveyed; locations were based on drill maps and photos. In December 2010, Allied Nevada geologists re-established collar locations for as many pre-2010 historical drill holes as possible. Most locations had physical features on the ground (i.e. drill casing) and were marked by stakes and metal tags on the side of the drill road. These sites have also been corroborated by an historical drill collar map. Kevin Haskew, a Professional Land Surveyor with Advanced Surveying & Professional Services in Goldfield, Nevada, subsequently surveyed the collars using the NAD83 datum. Seventy-three pre-2010 historical drill holes were located and surveyed and all 73 holes showed material differences of up to 50ft in collar locations. The database provided to RESPEC by WVM included the new 2010 survey data.

The author compared the 2010 survey data against the previous collar locations within the 2003 RESPEC database. The average x, y shift was 25ft in the Easting and 5ft in the Northing though the data showed variability of a fairly constant ± 10ft from these average values, with the occasional outlier of >25ft difference. To standardize the treatment of the pre-Allied drill collars within this current Mineral Resource, this shift was used to convert the collar locations of the remaining 51 un-surveyed, pre-Allied drill holes.

In addition to the revisions to the 51 drill collars noted above, one collar location was corrected for a likely typographical error, and minor changes were made to the final depths of two drill holes.

Downhole Survey:

No discrepancies were noted in the downhole survey data between data sets. None of the pre-Allied drill holes were surveyed.

Assays:

No material discrepancies were noted in the Hasbrouck assay data; the only differences noted pertained to decimal rounding differences.

12.1.2 AUDIT OF ALLIED DATA

Collar Locations:

The author validated Three Hills and Hasbrouck collar locations against the original collar survey data provided by Haskew Engineering. There were no discrepancies in Three Hills collar data; 16 Hasbrouck holes had differences of greater than 5ft between the original survey data and the WVM database. The current Hasbrouck database was revised to match the original survey data.

Downhole Surveys:

No material differences between the WVM database and original downhole surveys were observed. RESPEC added the downhole survey data for holes THC13-019 through THC13-023 which were missing from the WVM database.

Assays:

No material errors were noted in Three Hills and Hasbrouck gold assay data; only minor differences due to rounding were observed. Ninety-one silver values were corrected in the Hasbrouck database. The majority of these changes were due to the inclusion of cyanide-leach data instead of original fire assay values.

12.2 SITE VISIT

Mr. Bickel, Mr. Dyer, and Mr. Jorgensen visited the Hasbrouck Project on September 12, 2022. The site visit included a transect and overview of Three Hills, Hasbrouck, and Hill of Gold. During the site visit, the visitors reviewed drill sites and metallurgical sample collection points, mining and infrastructure plans for each deposit, and project geology including inspection of drill core at WVM's core facility in Tonopah. Tom Dyer and Ryan Baker also visited Three Hills and Hasbrouck mines on May 1, 2014, and Tom Dyer inspected drill core in June, 2014 with Mr. Tietz at KCA's facility. Mr. Defilippi conducted site visits at Three Hills and Hasbrouck on May 1, 2014 and January 31, 2023, at which time he inspected the properties and pertinent local infrastructure. Paul Tietz of MDA visited the Hasbrouck Project office and field site on July 25, 2014. The latter site visit included a review of the Three Hills cross-section gold model in the Tonopah office and site visits to both Three Hills and Hasbrouck mines. Drill site and mineralization verification procedures were conducted, and core drilling/sampling procedures were appraised. The result of the site visits is that the authors have no significant concerns with the project procedures.

12.3 DATA VERIFICATION SUMMARY STATEMENT

The author audited the Three Hills and Hasbrouck drilling databases and believes that the data are adequate for use in the Mineral Resource estimation and classification. Geotechnical site conditions at the heap-leaching facility ("HLF") and WRD at Three hills were verified by a field geotechnical investigation. The geotechnical site conditions at the HLF and WRD at Hasbrouck were confirmed by a site inspection, desktop study and testing of surface soil samples.

13.0 METALLURGICAL TESTING AND MINERAL PROCESSING

This section was prepared under the supervision of Mr. Mark Jorgensen of Jorgensen Engineering and Technical Services (JE&TS) who is an author and QP for this section of the report.

Three Hills Mine and Hasbrouck Mine samples responded well to cyanide leaching. Due to the grade and tonnage associated with each deposit, heap leaching was selected as the method for processing. The process flow and types of processing facilities are described in Section 17.

13.1 THREE HILLS HISTORICAL METALLURGICAL TESTING

The earliest available metallurgical tests of Three Hills Mine material include six column leach tests and 42 bottle roll tests of surface and drill samples from Three Hills Mine performed in 1996 by McClelland Laboratories ("McClelland").

In 2014, after WVM's acquisition of the property, metallurgical testing was conducted at KCA to confirm recovery, leaching time, and percolation performance of run-of-mine ("ROM") mineralized material.

Metallurgical tests from 1996 through 2015 for Three Hills are listed in Table 13-1.

13.2 HASBROUCK MINE HISTORICAL METALLURGICAL TESTING

Metallurgical test work was first performed for Hasbrouck Mine in the 1980's. These tests considered a variety of unit processes including agitation leach, vat leach, column leach, gravity tests and flotation tests. Drill cuttings, bulk surface samples and bulk underground samples were purportedly analyzed. However, pre-1989 test work was used only as an indication of the recovery and process method since the chain of custody and sample locations could not be verified.

This report considers the Hasbrouck Mine test work that has been completed since 2012 by McClelland and in 2014 by KCA.

Metallurgical tests from 2012 through 2014 for Hasbrouck Mine are also listed in Table 13-1.

Table 13-1 Summary of Hasbrouck Project Process Test Work

Date	Owner	Laboratory	Report No.	Sample Source	Test Work Type	Summary of Results
THREE HILLS						
11 Nov 1996	Eastfield	McClelland	2335	Drill Core Composites	Bottle roll and column leach tests	Bottle Roll avg extraction; Au - 74% at 96 hr. Column avg extraction; Au - 85%, 1.5" crush, 103 days
30 Nov 1996	Eastfield	McClelland	2335	Drill Core Composite	Column leach tails tests for environmental characterization	Negligible deleterious material detected
13 Dec 1996	Eastfield	McClelland	2390	RC Chips	Bottle roll tests	Average extraction; Au - 76% in 24 – 48 hr.
2 Jun 2014	WVM	Wetlabs	1405390	Surface sample	Environmental characterization	Negligible deleterious material
10 Jun 2014	WVM	KCA	0140069-THB01-01	Bulk Sample sites for 48in Column Test	Cyanide shake tests	Recoveries in line with other tests at 3HM
23 Oct 2014	WVM	KCA	140083-THB04-01	Composites from 6 diamond drill holes	ABA and Total Metal Analysis	Negligible deleterious material detected
27 Oct 2014	WVM	KCA	0140137-THB08-01	Drill Core TH13C0022 and Bulk Surface Sample	Bottle rolls, cyanide shakes	Confirmed that bulk sample for 48in column test is representative of lithology, head grade, and metallurgical performance recovery of general ore body
19 Mar 2015	WVM	KCA	140082-THB03-02	Bulk Sample for 48in Column Test	ROM 48in column leach and bottle roll tests	Bottle Roll extraction at 96 hr; Au - 91%, 10 mesh sizing Column extraction at 133 days; Au - 81%, ROM sizing

HASBROUCK						
Date	Owner	Laboratory	Report No.	Sample Source	Test Work Type	Summary of Results
8 Mar 2012	Allied	McClelland	3536	Drill Core Composites	Bottle roll and column leach for gold & silver extraction	Bottle roll (-10 mesh) avg extractions; Au - 69%, Ag - 23% Column leach (3/4" & 3/8") avg extractions; Au - 61%, Ag - 12%
14 Mar 2012	Allied	McClelland	3465	Drill Core Composites	Bottle roll and column leach for gold & silver extraction	Bottle roll (-10 mesh) avg extractions; Au- 62%, Ag - 24% Column leach (3/4" & 3/8") avg extractions: Au - 51%, Ag - 12%
11 Jun 2014	WVM	Wetlabs	1405636	Surface sample	Environmental characterization	Negligible deleterious material
18 Aug 2014	WVM	KCA	0140112-05HSB-01	Surface Samples	Bond Low Impact Crusher Work Index and Bond Abrasion	Crusher Work Index: 18.7 kWh/tonne Abrasion Index: 0.29
15 Jan 2015	WVM	McClelland	3948	Drill Core	Agglomeration, strength & stability	P80 3/8in crush, 5lb/ton cement is required to produce stable agglomerates.
5 Mar 2015	WVM	KCA	0140117-HSB07-01	Bulk Surface Sample	Cone Crusher and HPGR, Bottle Roll and Column Leach	Bottle roll (96 hr) – Au: Cone 35%, HPGR 49% Ag; Cone 19%, HPGR 30% Column leach (75 day) – Au; Cone 45%, HPGR 55% Ag: Cone 25%, HPGR 38%
9 Mar 2015	WVM	KCA	0140171-HSB11-01	Bulk Surface Sample	Compacted Permeability & Agglomeration on HPGR product	HPGR products are stable and permeable to 125ft depth when agglomerated with 4 lb/ton cement.
1 Apr 2015	WVM	KCA	0140171-HSB12-01	Drill Core	Cone crusher versus HPGR product extractions Bottle rolls	Cone crushing Au Recovery – 66.5%, Ag Recovery - 14% HPGR crushing Au Recovery - Au 72.5%, Ag Recovery - 14%

13.3 THREE HILLS MINE – ANALYSIS OF METALLURGICAL TEST WORK RESULTS

Three Hills was envisioned as a ROM heap leach. The amount of ore and the associated grade were the initial drivers in this decision. Column tests from core composites followed by a surface bulk sample 48-inch column were used determine the suitability of this type of process.

13.3.1 THREE HILLS MINE - ORE DESCRIPTION

Three Hills ore is contained primarily in the Siebert Formation with limited mineralization in the underlying Fraction Tuff where it is associated with clay alteration. The Siebert Formation consists of interlayered siltstones, sandstones, conglomerates, and tuffs. The coarser, more permeable sandstones and conglomerates are generally pervasively silicified and are the preferred hosts for gold mineralization.

13.3.2 THREE HILLS MINE - SAMPLE LOCATIONS

Figure 13-1 shows the location of the 1996 and 2012 diamond drill holes and 2014 bulk sample locations where material was obtained for use in Three Hills metallurgical test work programs. The samples are spatially and stratigraphically representative of the ore planned to be mined.

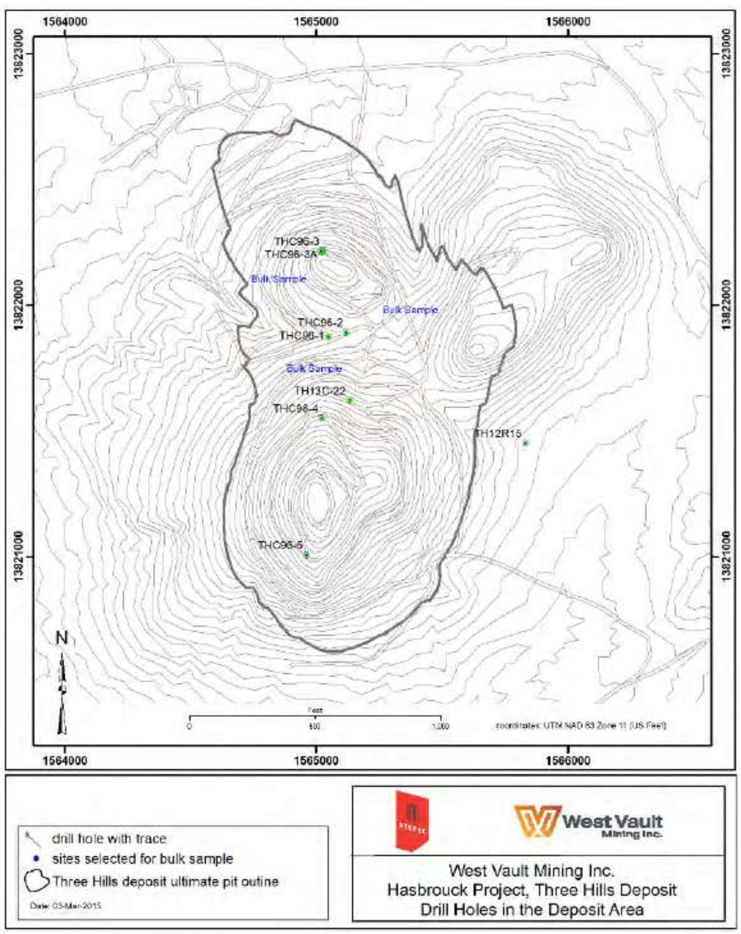

Figure 13-1. Locations of Three Hills Mine Metallurgical Test Samples

13.3.3 THREE HILLS MINE - BOTTLE ROLL TEST RESULTS

Bottle roll tests were completed in 1996 by McClelland, and in 2014 by KCA (report dated March, 2015), on composite samples from Three Hills Mine. The materials were crushed and milled as necessary to produce various sizes to determine the effect of grain size on gold and silver extraction. The results are presented and summarized in Table 13-2.

Table 13-2 Three Hills Bottle Roll Test Results
(data from McClelland (1996) and KCA (2015)

			Grade oz/ton			Consumption lb/ton		
Test	Material	Size (inches)	Head	Tails	Extracted Au, %	NaCN	Lime	Report
½ (THC96-1,2)	Three Hills	P80 1/4	0.041	0.014	68.2	0.16	5.3	11-Nov-1996
3 (THC96-3, 3A)	Three Hills	P80 1/4	0.025	0.006	73.9	0.10	4.4	11-Nov-1996
4 (THC96-4)	Three Hills	P80 1/4	0.024	0.006	75.0	0.10	4.9	11-Nov-1996
5 (THC96-5)	Three Hills	P80 1/4	0.009	0.002	77.8	0.16	4.5	11-Nov-1996
71051A	Three Hills	10 mesh	0.023	0.002	91.0	0.01	2.0	19-Mar-2015

Note: NaCN = sodium cyanide.

13.3.4 THREE HILLS MINE - COLUMN-LEACH TEST RESULTS

Two series of column leach tests were performed on Three Hills material, one by McClelland in 1996 using composites of diamond drill core and one by KCA in 2014 using composites of a bulk surface sample.

The drill hole composites for the McClelland test work were made up of intervals from the top of the hole to the bottom. As an example, Test 4 (THC96-4) contained 26 intervals of core from the drill hole surface to depth of 233 feet. In total the four composite samples represented 1,067 feet of the deposit.[3] The McClelland tests used 6-inch diameter, 10ft high columns and tested material crushed to P70 of 1.5 inches. Gold recoveries varied from 70 to 95 percent.

The KCA test conducted on a composite surface sample used a 48-inch diameter, 22ft high column and tested an uncrushed P80 3.8 inch material collected from drill roads by a track-mounted excavator. Gold recovery from the bulk surface sample was 81 percent.

[3] Heap Leach Cyanidation Evaluation – Three Hills and Hill of Gold, Drill Core Composites, MLI Job No. 2335, November 11, 1996, Tables 1, 2, 3, 4, Pages 3 - 8

Table 13-3 Three Hills Mine Column Tests, Grades and Reagent Consumption
(data from McClelland (1996) and KCA (2015)

Test	Material	Crush Size (inches)	Au Head Grade (oz/ton)	Au Tails (oz/ton)	Recovered Au (%)	NaCN lb/ton	Lime lb/ton	Report
½ (THC96-1,2)	Three Hills	P70 1.5	0.04	0.002	95	2.11	5	11-Nov-1996
3 (THC96-3, 3A)	Three Hills	P70 1.5	0.026	0.003	88.5	3.1	5	11-Nov-1996
4 (THC96-4)	Three Hills	P70 1.5	0.026	0.004	84.6	2.84	5	11-Nov-1996
5 (THC96-5)	Three Hills	P70 1.5	0.01	0.003	70	3.2	5	11-Nov-1996
71015	Three Hills	ROM (P80 3.8)	0.024	0.005	81	0.75	4	19-Mar-2015

Figure 13-2 shows the gold recovery of the two sets of column tests as a function of gold head grade. As noted previously, the four composites from the McClelland test work represent more than 1,000 feet of drill core. The gold recovery for these four composites is represented by the equation:

Gold Recovery = 0.1785ln(Gold Head Grade opt) + 1.5203

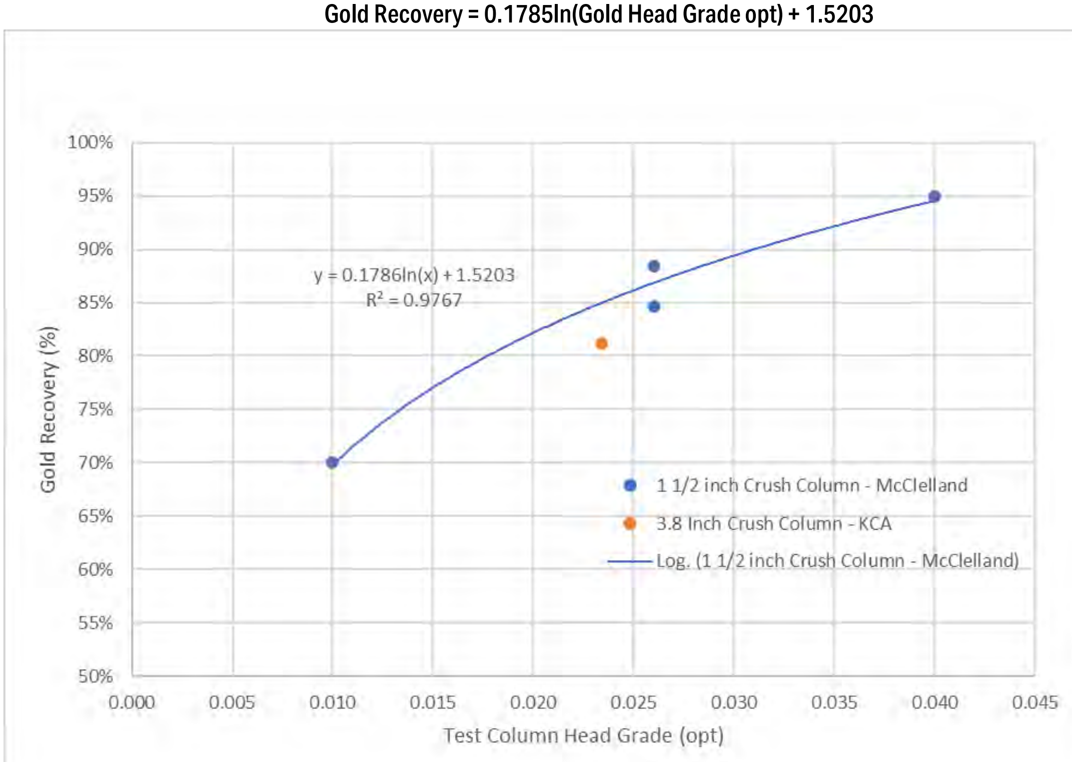

Figure 13-2. Three Hills Column Leach Tests – Gold Recovery vs Head Grade

The bulk surface sample gold recovery is within 3.0 percent of the statistical curve modeled in Figure 13-2. A review of the column test work for this sample would indicate that the 3.0 percent differential might well be achieved by extending the secondary leach time.

13.3.5 THREE HILLS MINE - RECOVERY VERSUS PARTICLE SIZE

The recovery of the gold by size fraction is critical given that the process is planned as a ROM heap leach. In this process, gold bearing material would be blasted and hauled directly to the leach pad and stacked for leaching. No intermediate crushing or agglomeration would be used to prepare the material for stacking.

Figure 13-3 shows the recovery by size fraction for the test work completed on the column leach tests performed on the drill core composites from Three Hills. Composites 1/2, 3, and 4 had recoveries greater than 70 percent for material that was minus 2.0 inches. Composite 5 required a particle size of minus 3/4 inch in order to realize a recovery above 70 percent. Composite 5 also had the lowest head grade at 0.008 opt compared to 0.023 opt to 0.040 opt for the other composites indicating that the material had not been mineralized to the same extent as the other composites.

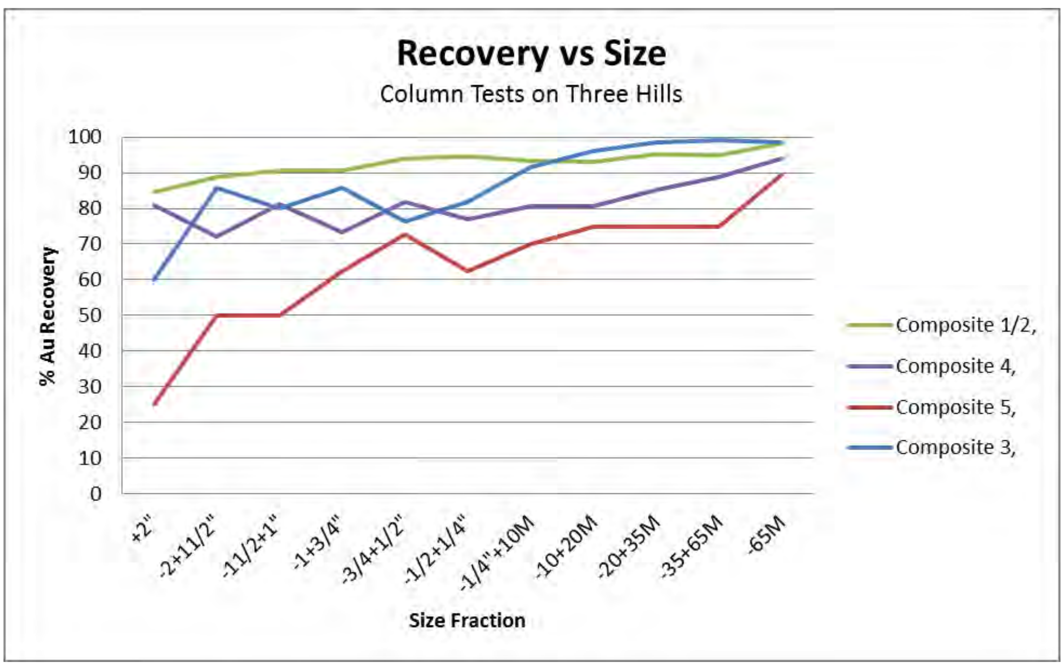

Figure 13-3 . Three Hills Mine Column Recovery by Size Fraction
(data from McClelland, 1996)

Figure 13-4 illustrates the gold recovery as a function of head grade, tail grade and size fraction for Composite 1/2. This composite has a very high head grade that is consistently above 0.010 opt for all size fractions and a gold recovery that is also above 80% for all size fractions.

Higher gold recovery from the coarser fractions indicates that the gold is not locked in silica in the sample, but rather that the gold is on the surface of the coarser particles. By nature, the silicified volcanic tuff is not likely to be porous. It is likely that the rock is breaking on fracture lines, which would expose the gold to leach solutions.

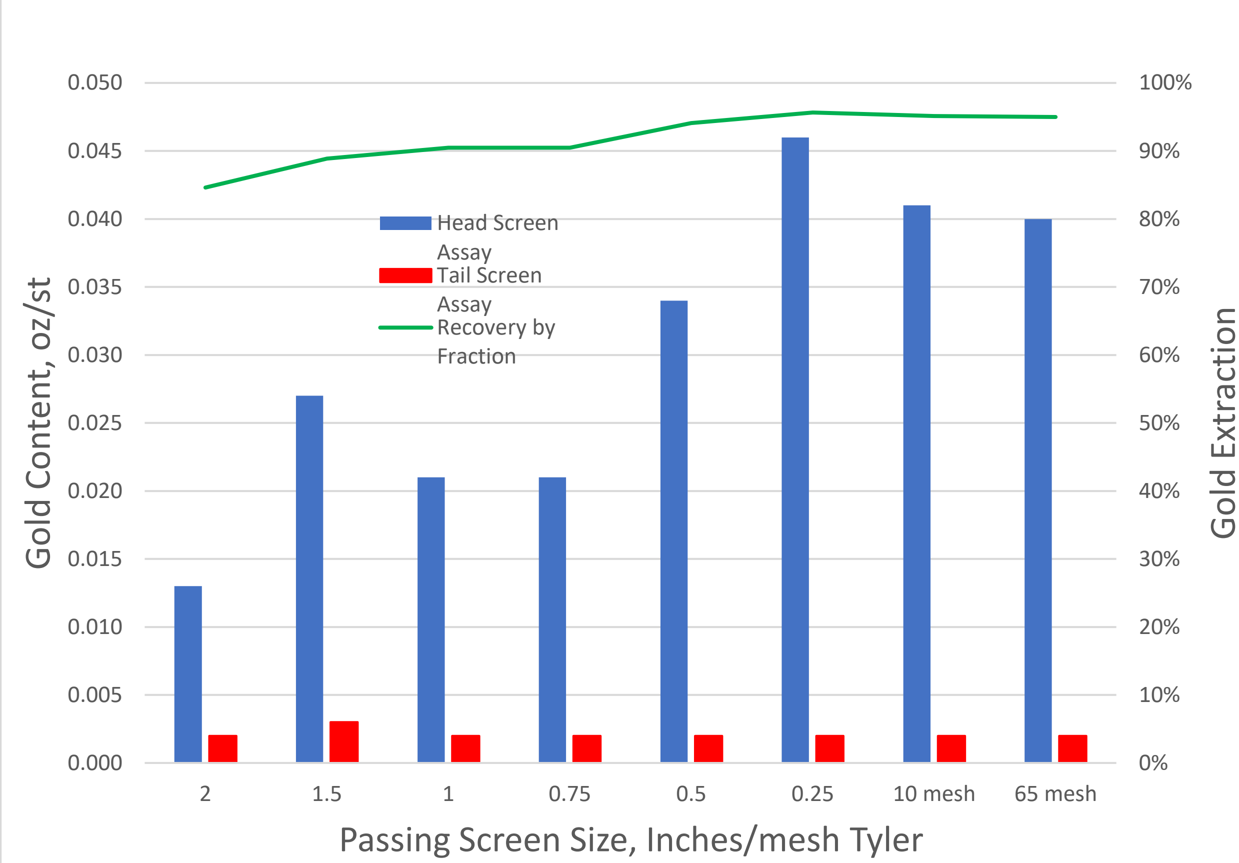

Figure 13-4. Recovery vs Grade and Size - Composite ½
(data from McClelland, 1996)

Figure 13-5 illustrates the gold recovery as a function of head grade, tail grade and size fraction for Composite 5. This composite has a low head grade that is consistently around 0.006 opt for all size fractions. Figure 13-4Figure 13-5 shows that the coarser fractions, +1 inch to +2 inch have a lower recovery, which varies from 25% to 50%. As the gold grade increases to a level around 0.010 opt and the size fraction decreases below 1 inch the recovery increases to 70%.

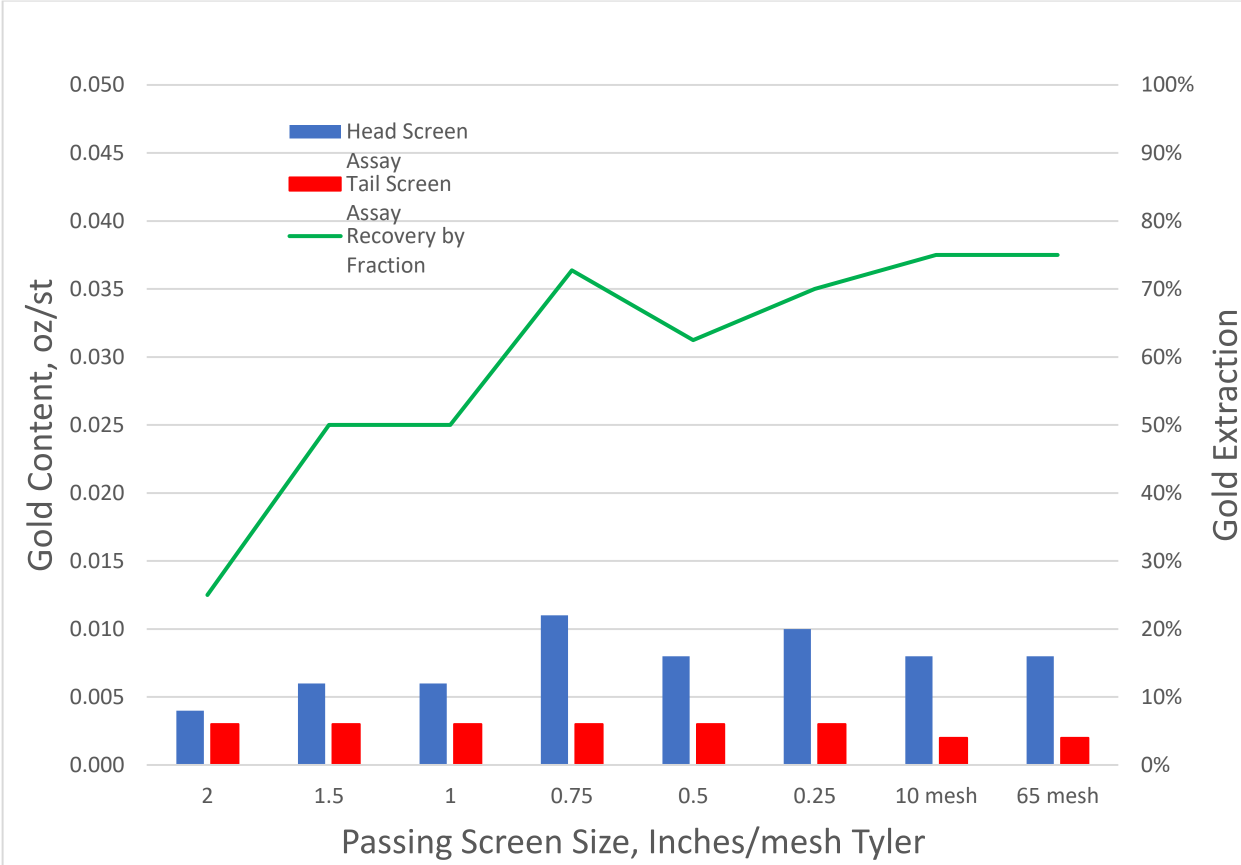

Figure 13-5. Recovery vs Grade and Size - Composite 5
(data from McClelland, 1996)

Figure 13-6 shows the recovery by size fraction for the test work completed on the 48-inch bulk column test performed on surface samples. The recovery for the coarser size also appears to be related to head grade. The coarser fractions, 1 inch to 12 inches have a lower head grade of less than 0.010 opt and recoveries that vary from 20% to 50%. The size fractions that are less than 1 inch have head grades that vary from 0.025 opt to 0.040 opt and recoveries that vary from 60% to 80%.

The recoveries and head grade for the 48-inch surface sample appear to fall in the spectrum encompassed by Composites 1 through 5. The overall head grade of the 48-inch surface sample is 0.0234 opt and the overall recovery is 81%. The coarser fractions with lower grade have slightly higher recoveries than Composite 5. The finer fractions with higher grade have higher recoveries similar to Composite 4. While collected on the surface, the sample can be considered as representative of a part of the ore deposit.

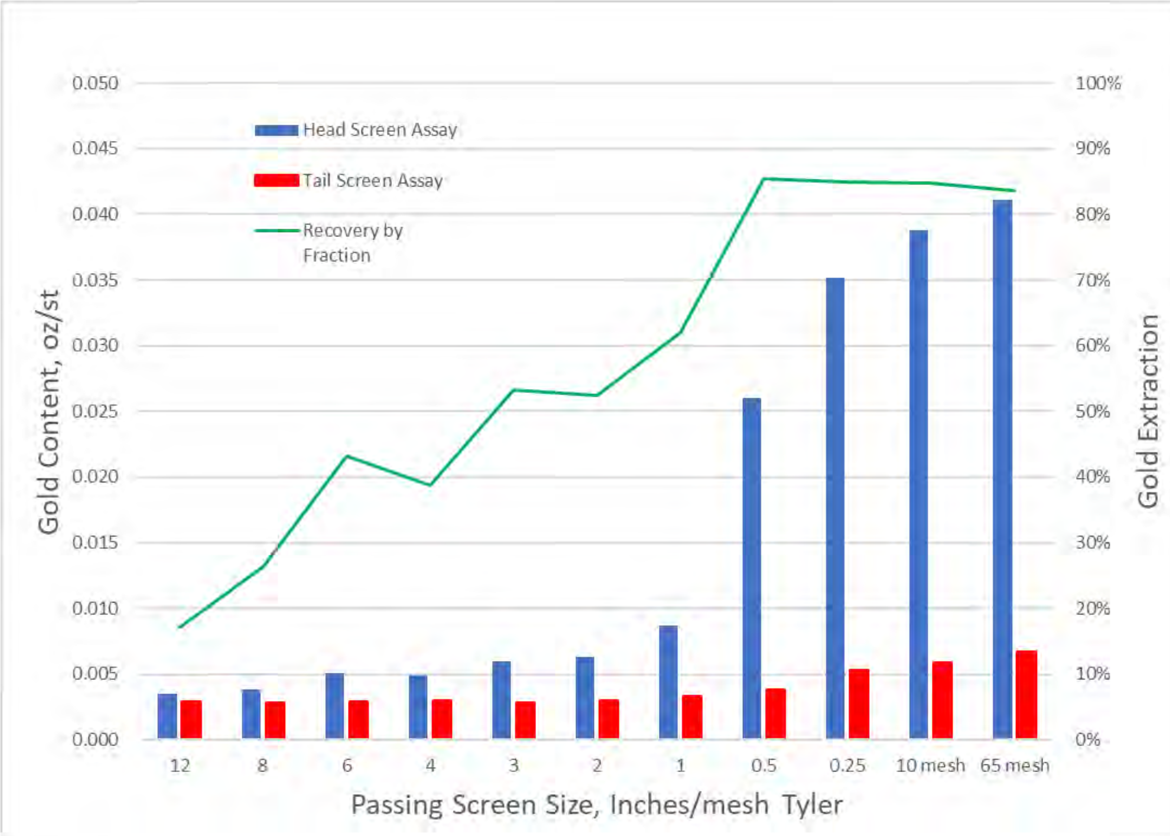

Figure 13-6. 48-Inch Column – Recovery by Size Fraction
(KCA Test No. 71015)

Again, permeability tests performed and discussed in later parts of this report will indicate that the material has some porosity issues. However, the test work and size fraction recovery would again indicate that the gold is being deposited on boundaries or in veinlets where the rock would break as a result of mining.

13.3.6 THREE HILLS MINE - LEACH CYCLE DURATION

Figure 13-7 shows the leach curve for the bulk sample. The column was leached/rinsed for a total period of 133 days at a rate of 0.0025 gpm/ft^2. The 15-day leach period from 120 days to 135 days shows that the recovery increased by an additional 1.5 percent. The slope of the curve at this point indicates that additional recovery is likely to occur even after the 135 days. With this additional recovery, the KCA bulk sample at P80 of 3.8 inches should match the recovery achieved by the smaller crush size for the P70 1.5-inch columns tested at McClelland.

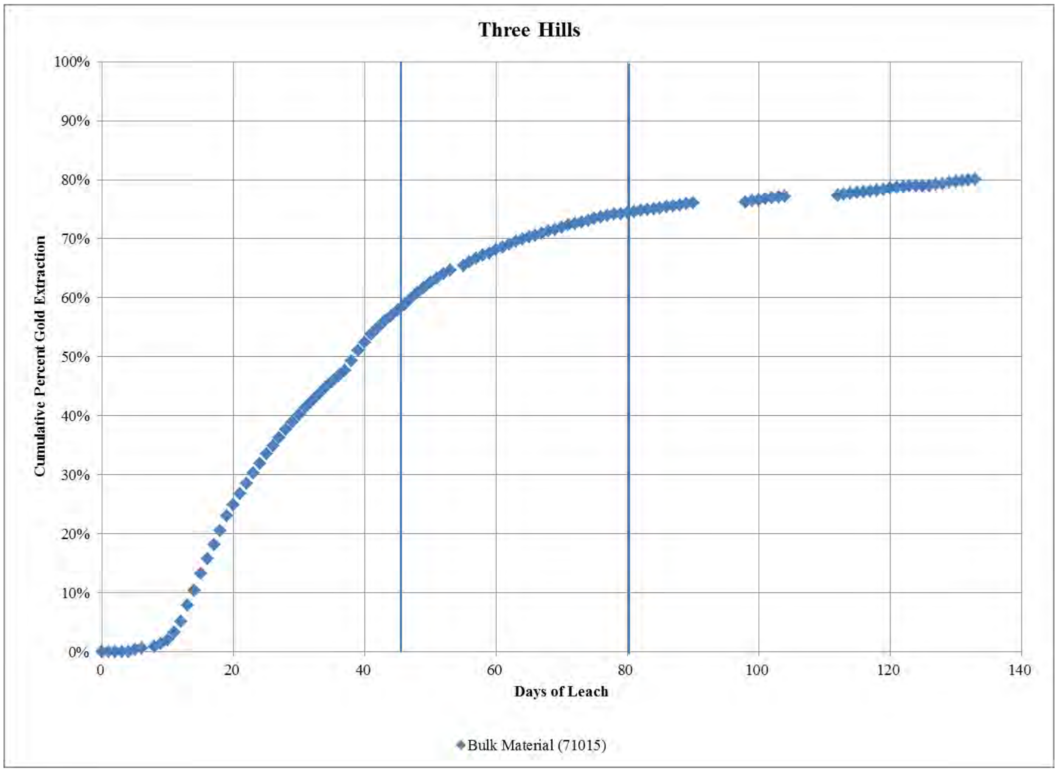

Figure 13-7. 48in Column Test Recovery vs. Time
(KCA, 2015)

Field leach cycle duration has been predicted using data from the 2014 KCA 48-inch column tests. Field leach durations are typically longer than the column leach durations due to solution application rates being lower and column leach mechanics of diffusion and displacement not precisely representing the flow of fluid of a heap. Generally, the greater the diameter of the column, the more closely it approximates to field leach times.

There are three distinct domains in a column leach curve. The "initial leach", the "bend" or "knee" and the "final tail out" as shown in Figure 13-7.

Empirical formulas based on experience were used to relate column days to field days as shown in Table 13-4.

Table 13-4. Predicted Three Hills Mine Field Leaching Times

Domain	Column Days	Empirical Factor	Predicted Field Days
Initial Leach	0-45	1.6	72
Bend/Knee	45-80	1.3	46
Final Tail	80-133	1.0	53
Predicted Leach Cycle Duration			171

13.3.7 THREE HILLS MINE - PROJECTED CONSUMPTION OF REAGENTS

13.3.7.1 THREE HILLS MINE CYANIDE CONSUMPTION

The 2014 KCA ROM column test data were used to predict field cyanide consumption as shown in Table 13-3. In this test, 0.75 lb NaCN/ton was consumed. To address the difference between laboratory-scale columns and full-scale heap leach operations, the test value of 0.75 lb NaCN/ton was multiplied by 0.6, resulting in a prediction for full-scale heap leach cyanide consumption of 0.45 lb/ton. This factor is based on field experience of multiple similar heap-leach operations.

The bottle roll results for the McClelland test work (1996) and the KCA test work (2014) shown in Table 13-2 indicated that cyanide consumptions were low at less than 0.2 lb NaCN/ton. Experience with other properties would indicate a heap leach cyanide consumption of 0.5 lb/ton.

A cyanide consumption of 0.45 lb/ton is predicted for Three Hills Mine.

13.3.7.2 THREE HILLS MINE LIME CONSUMPTION

Lime ("CaO") will be required for pH control of the leaching solutions at Three Hills Mine. Based on the average lime consumed in the KCA (2014) ROM column test found in Table 13-3, lime consumption is predicted to be 4.0 lb/ton.

13.3.8 THREE HILLS MINE - PERMEABILITY RESULTS

Lab-scale compacted permeability tests were performed by KCA in 2014 on tailings material from the ROM 48-inch diameter column, screened to -3 inch, this being the largest particle size that the KCA test equipment was capable of testing. The results of these tests are shown in Table 13-5.

Tests 71080A and B percolated at a rate of 0.020 and 0.085 gal/min/ft^2 under a load that was equivalent to a heap height of 60 feet. However, the tests were classified as "fail" since the material did not wet in the center, indicating that the solution bypassed the material around the wall of the test cylinder. Test 71080C, which was loaded with column tailings containing 19% moisture, failed at 60 feet.

Test 71094A was put under a load equivalent to 120 and 200 feet. There was a flow of 0.004 and 0.003 gal/min/ft^2 which is equal or two times greater than the leach rate of 0.0025 gal/min/ft^2. However, a flow rate of 10 times the application rate is usually considered as a minimum to ensure that the heap will percolate. Hence, these tests were also considered as a "fail".

Test 71094B was screened at 6 inches and put under load at 200 feet and had a measured permeability of 0.010 gal/min/ft^2, which is only four times the application rate, hence, it was rated as "fail".

Table 13-5. Summary of Compacted Permeability Tests on 48-inch Column Tailings

KCA Sample No.	KCA Test No.	Description	Effective Height, feet	Soak Time, hrs	Flow Rate, gal/min/ft^2	Screened Size, inches	% Pellet Breakdown	% Slump	Pass/Fail
71078 A	71080 A	Bulk Material - Column Tailings	60	0.5	0.020	-3"	N/A	5	Fail[1]
71078 A	71080 B	Bulk Material - Column Tailings	60	4.0	0.085	-3"	N/A	9	Fail[1]
71078 A	71080 C	Bulk Material - Column Tailings @ 19% Moisture	60	N/A	0.001	-3"	N/A	2	Fail
71093 A	71094 A[2]	Bulk Material - Column Tailings	120	2.3	0.004	-3"	N/A	6	Fail
			200	2.3	0.003	-3"	N/A	7	Fail
73114 A	71094 B	Bulk Material - Column Tailings	200	2.7	0.010	-6"	N/A	6	Fail

Note[1]: The material did not wet in the center on 71080 A and 71080 B.

Note[2]: Stage loaded tests. The applied load was not removed in between testing the two heap heights.

A comparison of the material sizing showed a higher proportion of fines in the percolation test sample when compared to the fines content of 1.5-inch crushed ore from the McClelland test columns. Table 13-6 compares the two sample sets and shows that on average the McClelland test columns had approximately half the amount of fines in the 10 mesh minus size that were in the KCA test column even after crushing to 1.5 inches.

Table 13-6. Column Leach Tailings Size Analysis – Minus 10 Mesh

Column Leach Tailings Size Analysis	McClelland (1996)				KCA (2014)
	Composite 1/2 (%)	Composite 3 (%)	Composite 4 (%)	Composite 5 (%)	48 inch Column (%)
Leach Tailings < 10 Mesh	13	16.3	8.3	5.3	20.3

A visual inspection of the core was performed during a site visit in October 2022. The core showed little if any sign of clay or excessive fines.

A visual inspection of the location where the bulk surface samples were collected was also performed during the same site visit. Two of the sites visited showed signs of weathered material.

Based on the site visit there are indications that the core material is permeable and will percolate. Further permeability testing should be performed to confirm that the ROM ore can be mined, stacked, and leached and to confirm that the issues associated with the permeability of the 48-inch test column were caused by weathered surface material.

13.4 HASBROUCK MINE - ANALYSIS OF TEST RESULTS

In 2014 and 2015, WVM commissioned tests at KCA to evaluate the relationships between particle size and recovery, host-rock lithology and recovery, and elevation and recovery. The use of an HPGR for crushing Hasbrouck Mine ore was also evaluated during this same time period. Metallurgical tests conducted prior to 1988 were summarized by Wilson (2014) and are consistent with results of later tests, but have not been included as the sample locations are not known.

Metallurgical test work is summarized in Table 13-1.

13.4.1 HASBROUCK MINE - ORE DESCRIPTION

The Hasbrouck Mine ores are contained in the Siebert Formation. The Siebert Formation is separated into two lithological packages designated the Upper Siebert and the Lower Siebert. The Upper Siebert is dominated by sandstones and conglomerates and is heavily silicified. The Lower Siebert is dominated by lithic tuff with interbedded siltstones and sandstones. The contact between the Upper and Lower Siebert is gradational over a 50 to 100 feet elevation range due to overlapping lithologies between the two units. Post-depositional faulting has produced vertical offsets of the modeled contact of up to 100 feet.

13.4.2 HASBROUCK MINE - SAMPLE LOCATIONS

The locations of the core holes and intervals of drill samples used in the Hasbrouck Mine metallurgical test work in 2012-2015 are shown in Figure 13-8. The locations of bulk surface samples are shown in Figure 13-9 The samples are considered to be spatially and stratigraphically representative of the ores to be processed.

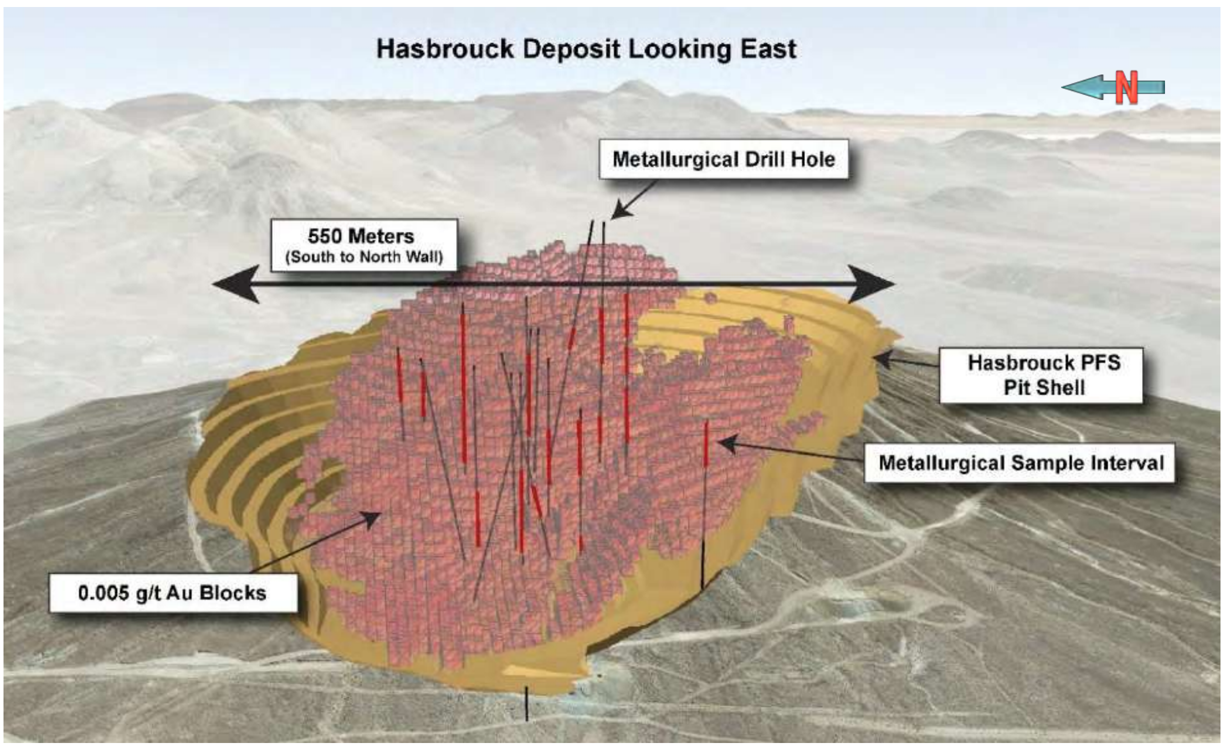

Figure 13-8. Hasbrouck Mine Drill-hole Metallurgical Samples 2012 – 2014,
(Perspective view relative to block model and proposed pit; Dyer et al., 2016)
Note: Not to Scale

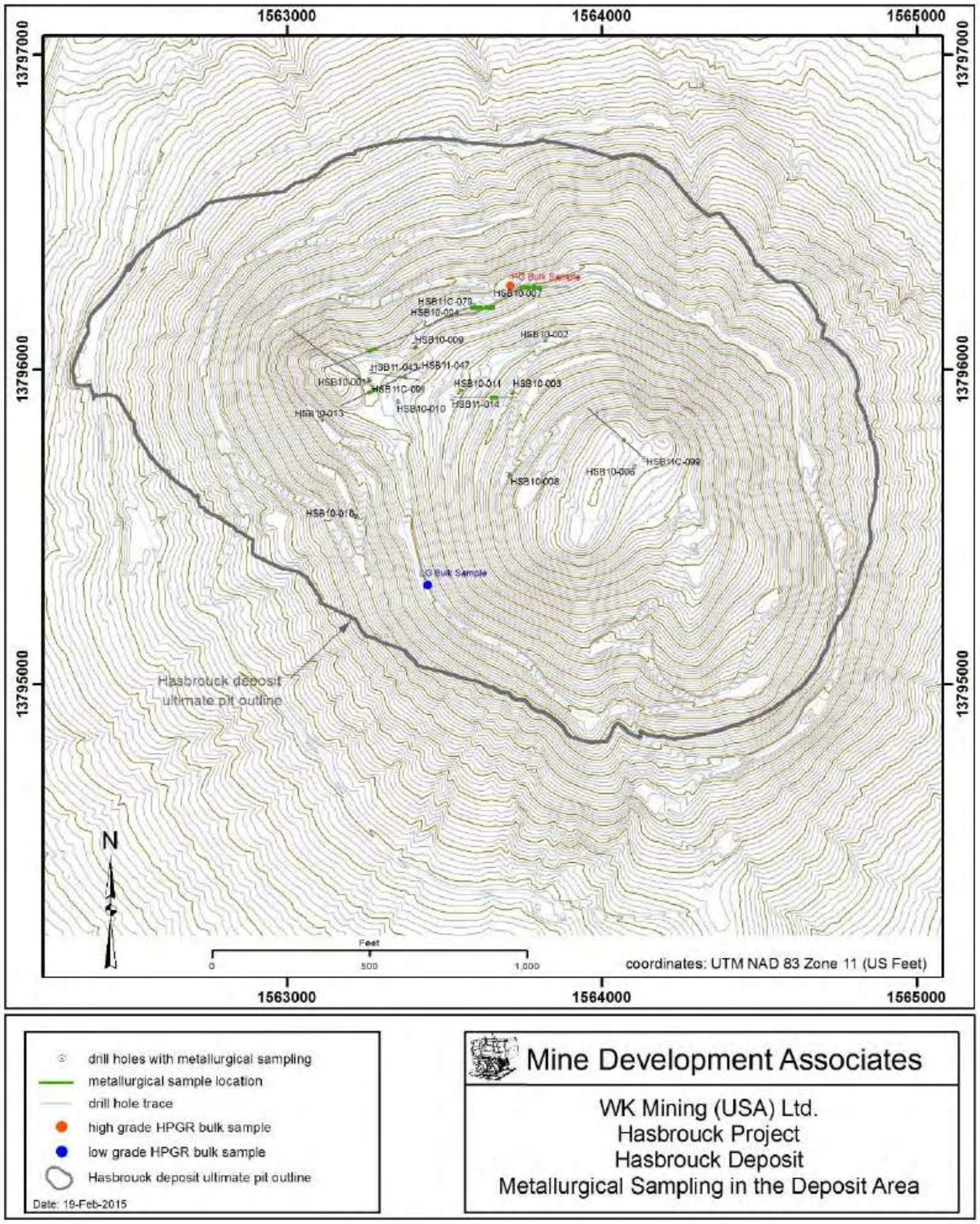

Figure 13-9. Locations of 2012 – 2014 Hasbrouck Mine Samples for Metallurgical Testing

13.4.3 HASBROUCK MINE - BOTTLE ROLL TEST RESULTS

Bottle roll tests on 19 samples were completed in 2012 at McClelland on composite samples from the Hasbrouck Mine and the data were reported by McPartland (2012) and Wright (2012). The bottle roll tests were done at 10 mesh and 200 mesh grinds in order to determine the effect of particle size on gold and silver extraction. A summary of the results is presented in Table 13-7.

Table 13-7 shows that the average the gold recovery for 10 mesh material was 65.9%. The data for gold recovery (not shown) varied from 39.1% to 85.7%. Average gold recovery for a 200 mesh grind was 89.3%. The data for gold recovery (not shown) varied from 75% to 96.8%. The grind size to 200 mesh resulted in a 23% improvement in gold recovery. For a 200 mesh grind, silver recovery increased from 23.2 to 50.7%, which is an improvement of 27.5%.

Cyanide consumption averaged 0.2 lbs/ton but varied from 0.14 lbs/ton to 1.25 lbs/ton. There were three samples with gold recoveries ranging from 95% to 97% that accounted for much higher than average cyanide consumptions.

Lime consumptions averaged 2.8 lbs/ton and varied from 1 to 4.2 lbs/ton.

Table 13-7. Summary of Hasbrouck Mine Bottle Roll Test Results
(Data from McPartland, 2012 and Wright, 2012)

		Head Grade, oz/ton		Extraction, %		Consumption, lb/ton	
Material	Size (mesh)	Au	Ag	Au	Ag	NaCN	Lime
Hasbrouck	10M	0.024	0.56	65.9	23.2	0.14	2.4
Hasbrouck	200M	0.022	0.53	89.3	50.7	0.20	2.8

13.4.4 HASBROUCK MINE – COLUMN LEACH TESTS

Allied Nevada commissioned 70 column tests in two different sample submissions to McClelland in 2012. Columns were loaded with composite samples sized at P80 3/4 inch and P80 3/8 inch sizes. Results are presented in Table 13.8.

Table 13-8 shows that the gold recovery for the 3/8 inch column tests averaged 65.4% and 53.6%. The gold recovery for the 33 column tests (not shown) varied from 28.6% to 90%. Average gold recovery for a 3/4 inch crush was 61.3% and 48.2%. The data (not shown) varied from 23.1% to 85.7%. There was a small difference in gold recovery of approximately 4% between the 3/8 inch and 3/4 inch columns for the two sets of data.

Silver recovery for the 3/8 inch columns was approximately 14% for both the Upper and Lower Seibert formations.

Table 13-8. Summary of Hasbrouck Mine Column Leach Test Results on Cone Crushed Material
(Data from McPartland, 2012 and Wright, 2012)

	Au Average Recovery (%)		Ag Average Recovery (%)	
	-3/4 inch	-3/8 inch	-3/4 inch	-3/8 inch
McClelland Job No.3536	61.3	65.4	10	13.8
McClelland Job No.3465	48.2	53.6	9.1	13.9

13.4.5 HASBROUCK MINE - GOLD RECOVERY BY LITHOLOGY AND ELEVATION

The 3/8 inch column leach data was analyzed by lithology and a difference in gold recovery was identified between the Upper Siebert and Lower Siebert lithologies.

The difference in gold recoveries between the two Siebert stratigraphic units is most likely due to the degree of silicification of the ore. Pervasive silicification, hydrothermal brecciation, and siliceous veining are common within the Upper Siebert volcaniclastic rocks. Silicification and veining are less pervasive and mineralization is more structurally controlled within the Lower Siebert tuffaceous and fine-grained sedimentary rocks. Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones and is most common in the Lower Siebert tuffaceous rocks.

A recovery relationship between gold recovery, lithology and depth below the surface was determined and is illustrated in Figure 13-10. An analysis of grade versus recovery within the two different lithologies did not yield a recovery relationship.

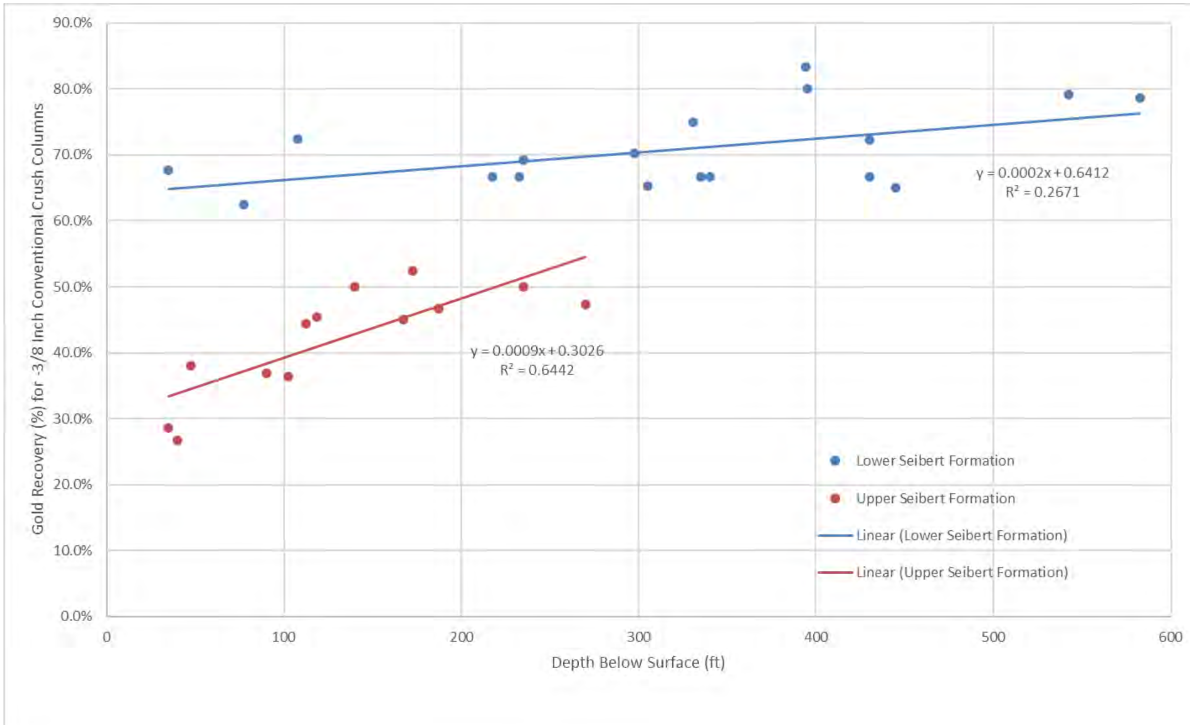

Figure 13-10. Hasbrouck Mine Column Leach Gold Recovery by Stratigraphic Unit and Depth Below Surface

13.4.6 HASBROUCK MINE - HIGH-PRESSURE GRINDING-ROLL TESTING

HPGR crushing was tested to determine if gold recovery could be improved. The HPGR crushes the rock by applying high pressure by means of two counter-rotating tungsten-carbide studded rollers that are controlled by hydraulic rams. Literature suggests that the crushing action may selectively open microfractures which allow cyanide access to planes of weakness in the rock. Figure 13-11 shows the HPGR unit used at KCA for testing.

Figure 13-11. View of SMALLWAL HPGR unit at KCA Used for Testing Hasbrouck Mine Samples

Due to the way material flows through the HPGR, material at the outer edges of the rollers is less contained and is subjected to lower forces than material that flows through the center. Consequently, edge material is crushed less and in certain applications operators choose to recycle edge material to achieve more thorough crushing of HPGR product.

13.4.6.1 HASBROUCK MINE – HPGR TEST FOR SURFACE BULK SAMPLE

The first HPGR test that was performed by KCA was with a surface sample collected from two different sites at the Hasbrouck Mine as shown in Figure 13-9. This sample consisted of approximately 80% Upper Siebert and 20% Lower Siebert material. It was cone crushed to P80 3/4 inch, assayed, and mixed to form a single 800kg composite sample, from which 50kg was separated and crushed by a conventional (cone) crusher to P80 3/8 inch, this being the smallest particle size that can be practically produced at full-scale by a conventional crusher. The remaining 750kg of the composite sample was crushed by the HPGR.

The HPGR crushed material was also tested as to whether there was a difference in recovery due to the edge effect.

All material was agglomerated with cement prior to loading in the test column leach. Results of the HPGR and conventional-crush column leach tests on the crushed bulk surface sample are shown in Table 13-9.

Table 13-9. Hasbrouck Mine HPGR Test Series 1 – Column Test Recoveries

(Data from KCA, 2015)

KCA Test ID	71060	71063	71066
Description	Conventional Crush	HPGR Center	HPGR Center + Edge
P80 - Crush Size (in)	0.38	0.26	0.32
Calculated Head Gold (oz Au/ton)	0.0243	0.0275	0.0247
Extracted Gold (oz Au/ton)	0.011	0.0151	0.0127
Weighted Avg. Tail Screen (oz Au/ton)	0.0133	0.0124	0.012
Extracted Gold (%)	45%	55%	51%
Calculated Head Silver (oz Ag/ton)	0.385	0.371	0.376
Extracted Silver (oz Ag/ton)	0.097	0.14	0.131
Weighted Avg. Tail Screen (oz Ag/ton)	0.288	0.231	0.245
Extracted Silver (%)	25%	38%	35%
Calculated Tail p80 Size (in)	0.38	0.26	0.32
Days of Leach	75	75	75
Consumption NaCN (lb/ton)	1.73	1.8	1.81
Addition Hydrated Lime (lb/ton)	0	0	1.01
Addition Cement (lb/ton)	4.04	4.06	4.03

The results of the HPGR crusher tests indicate that gold recovery improved from 45% for a conventional 3/8 inch crush to 55% for an HPGR center-crushed material. Silver recovery improved from 25% for a conventional 3/8 inch crush to 38% for an HPGR center-crushed material.

13.4.6.2 HASBROUCK MINE – HPGR TEST FOR LOWER SEIBERT CORE SAMPLES

The second set of HPGR tests was performed on core samples from Lower Siebert material. Material for this test was obtained from four diamond core holes whose locations are noted in Figure 13-9. Core was conventionally crushed to P80 3/4 inch, and 5kg was split from each and conventionally crushed to P80 3/8 inch. The remaining P80 3/4in material was crushed with an HPGR. HPGR center and edge products were collected separately. No size distribution data were collected.

Gold and silver extractions were determined with bottle roll tests and summarized in Table 13-10. The results indicate that improvements in gold recovery ranged from 2% to 9% and averaged 5% for the material that was subjected to the HPGR center crush as opposed the conventional 3/8 inch crush. The results indicate that improvements in silver recovery ranged from 2% to 5% and averaged 3% for the material that was subjected to the HPGR center crush as opposed the conventional 3/8 inch crush.

A 5% improvement in leach column gold recovery was assigned to the Lower Seibert formation for a process that would utilize HPGR.

A 3% improvement in leach column silver recovery was assigned to the Lower Seibert formation for a process that would utilize HPGR.

13.4.6.3 HASBROUCK MINE – HPGR EFFECT ON UPPER SEIBERT GOLD RECOVERY

The bulk surface sample that was collected was an indicator of what increase might be realized for the Upper Seibert gold recovery using HPGR recovery. As noted above, the bulk surface sample gold recovery increased from 45% to 55%. However, the bulk surface sample was made up of 80% Upper Seibert and 20% Lower Seibert formation as noted by KCA.

In order to calculate the effect of HPGR on Upper Seibert recovery, the Lower Seibert gold recovery was estimated at surface from Figure 13-10 to be 65%. A weighted average calculation was then completed which showed that the Upper Seibert gold recovery was 40% for a conventional 3/8 inch crush leach column. A 5% recovery enhancement for HPGR was added to the Lower Seibert calculation and the weighted average calculation was repeated. The result was that gold recovery due to HPGR increased to 51.25%, which indicated that the HPGR had an overall gold recovery effect of 11.3% on Upper Seibert ore.

A 10% improvement in gold recovery was assigned to the Upper Seibert Formation for a process that would utilize HPGR.

A 10% improvement in silver recovery was assigned to the Upper Seibert Formation.

Table 13-10. Hasbrouck Mine HPGR – Lower Siebert Bottle Roll Gold and Silver Recoveries

Description				Cone Crush			HPGR Center			
	Ave. Elev. ft	Siebert	Rock Type	Au Head oz/ton	Au Tail oz/ton	Au Recovery at 96 hr %	Au Head oz/ton	Au Tail oz/ton	Au Recovery at 96 hr %	Difference in HPGR vs Cone Crush Recovery %
HSB11-043; 494'-532'	5520	Lower	Tsw	0.018	0.013	69%	0.019	0.004	78%	9%
HSB11C-079; 572'-627'	5500	Lower	Tsw	0.018	0.006	69%	0.02	0.006	71%	2%
HSB11C-091; 532'-541':550.5'-577'	5565	Lower	Tslt	0.019	0.005	74%	0.017	0.0037	78%	4%
Average										5.0%
Description				Cone Crush			HPGR Center			
	Avg. Elev. ft	Siebert	Rock Type	Ag Head oz/ton	Ag Tail oz/ton	Ag Recovery at 96 hr %	Ag Head oz/ton	Ag Tail oz/ton	Ag Recovery at 96 hr %	Difference in HPGR vs Cone Crusher Recovery %
HSB11-043; 494'-532'	5520	Lower	Tsw	0.287	0.276	4%	0.283	0.266	6%	2%
HSB11C-079; 572'-627'	5500	Lower	Tsw	0.465	0.452	3%	0.468	0.442	6%	3%
HSB11C-091; 532'-541':550.5'-577'	5565	Lower	Tslt	0.163	0.152	7%	0.163	0.143	12%	5%
Average										3.3%

13.4.6.4 HASBROUCK MINE – HPGR MICROFRACTURES

Literature suggests that HPGR crushing may selectively open microfractures which allow cyanide access to planes of weakness in the rock. Size distribution for the bulk surface sample (Table 13-9) crushed material shows that the P80 decreases from 0.38 to 0.26 inches from a conventional crush to a HPGR crush.

Bottle roll tests for the Upper Seibert were done at 10 mesh, which would be equivalent to a P80 of 0.079 inches. The average bottle roll recovery at 10 mesh for these samples was 52%, which was an improvement of an average of 10% over the conventional crush 3/8 inch columns. This recovery was similar to the 10% recovery boost that the test results showed for HPGR.

Bottle roll tests for the Lower Seibert were also done at 10 mesh, which would be equivalent to a P80 of 0.079 inches. The average bottle roll recovery at 10 mesh for these samples was 73.4%, which was an improvement of an average of 3.8% over the conventional crush 3/8 inch columns. This recovery was similar the 5% recovery boost that the test results showed for HPGR (See Appendix D.8).

In summary, it appears that the recovery achieved by HPGR crushing at a P80 of 0.26 inches closely matches the recovery achieved by 10 mesh (0.079 inches) in bottle roll tests that have a much finer grind size, indicating that the microfracture mechanism is effecting the gold recovery.

To obtain maximum benefit from the finer crushing and microfractures generated by an HPGR, the crushing circuit will be configured to recycle a certain percentage of edge material.

13.4.7 HASBROUCK MINE - LEACH CYCLE TIME RESULTS

The 2012 Hasbrouck Mine column test results for the -3/8 inch, conventionally crushed materials were studied to estimate an average value for leach cycle duration.

Field leach duration has been predicted based on the 2012 McClelland 6-inch column tests. Experience teaches that field leach durations are typically longer than the column leach durations due to solution application rates being lower and column leach mechanics of diffusion and displacement not precisely representing the flow of fluid in that occur in a heap. Generally, the greater the diameter of the column, the more closely it approximates to field leach times.

There are three distinct domains in a column leach curve. The “initial leach”, the “bend” or “knee” and the “final tail out”. The leach duration results from the 2012 column tests were highly variable due to grade and lithology.

Leach cycle duration is predicted to be 115 days as shown in Table 13-11.

Table 13-11 Hasbrouck Mine Leach Cycle Duration

Column Leach Domain	Column Days	Empirical Factor	Predicted Field Days
Initial leach	15	3.0	45
Bend/Knee	20	1.5	30
Final Tail	40	1.0	40
Predicted Leach Cycle Duration			115

Data from the large number of column leach tests on 3/8 inch crushed material provide a good basis for predicting the leach time required for the HPGR crushed material. The average leach time of all the 2012 column leach tests on conventionally crushed 3/8 inch material was 115 days. The 2014 column leach tests on HPGR crushed material were completed in 3 inch columns and were terminated at 75 days, i.e., before leaching was completed. These column tests were terminated at 75 days as the HPGR and conventionally crush material had both reached their "final tail" with a similar recovery rate (on a daily basis) and the difference in total gold recovery between the two products had been established. Based on the similarity at 75 days, it is predicted that HPGR crushed material will achieve complete gold recovery at the same time as the conventionally crushed material of 115 days.

13.4.8 HASBROUCK MINE – CYANIDE CONSUMPTION

The 2015 column leach tests on HPGR crushed materials consumed an average of 1.81 lb NaCN/ton, a slight increase compared to the conventionally crushed material in the same tests that consumed 1.73 lb NaCN/ton (KCA, March, 2015). Based on experience, consumption of cyanide during production is expected to be 40% of the KCA HPGR laboratory consumption results, or 0.75 lb NaCN/ton.

13.4.9 HASBROUCK MINE - AGGLOMERATION AND PERMEABILITY TEST RESULTS

Agglomeration tests were performed to evaluate the need to agglomerate both conventionally crushed and HPGR crushed ore. Experience with fine crushed ores is that agglomeration is often required even if permeability is acceptable at lower lift heights. As the heap height approaches and exceeds 100 feet, agglomeration is required to maintain percolation. Agglomeration tests were followed by compacted permeability tests conducted under a compaction loading equivalent to a 125 feet tall heap. Results of the compacted permeability tests are presented in Table 13-12.

Table 13-12 Hasbrouck Mine Compacted Permeability Test

(Data from KCA, 2015)

KCA Test ID	Description	Cement Added (lb/ton)	Effective Height (feet)	Flow Rate (gpm/ft^2)	Crush Size (inches)	% Pellet Breakdown	% Slump	Effluent Ave pH	Pass/Fail
71081 A	HPGR Crushed Center	9	125	2,389	0.3	<3	0	11.6	Pass
71081 B	HPGR Crushed Center	4	125	2,033	0.3	<3	0	11.1	Pass
71081 C	HPGR Crushed Center	2	125	2,488	0.3	<3	0	9.49	Pass

Results show that the agglomerates were stable and permeable at 125 feet of effective height. However, the pH of the effluent was 9.5 for at a cement addition rate of 2 lb/ton. Thus, an addition rate of 4 lb/ton cement is recommended to maintain pH above 10.5 in the heap.

13.4.10 HASBROUCK MINE - WORK INDEX AND ABRASION INDEX TEST RESULTS

Standard comminution tests were performed on representative Hasbrouck Mine surface samples by ALS Metallurgy under the supervision of KCA. The materials were combined into a composite sample and subjected to a Bond Low Impact Crusher test and a Bond Abrasion test. Results are summarized in Table 13-13.

Table 13-13. Hasbrouck Mine Bond Crusher Work Index and Abrasion Index

(Data from Albert, 2014)

KCA Sample No.	Description	Crusher Work Index Values kW-hr/MT	Crusher Work Index Values kW-hr/st	Abrasion Index Values Ai
71028	Hasbrouck	18.71	16.97	0.2856
Note - Comminution test work completed by ALS Metallurgy, Kamloops, BC Canada.				

Results show that this material is hard to crush and moderately abrasive.

13.5 SUMMARY OF TEST RESULTS AND CONCLUSIONS

13.5.1 THREE HILLS MINE - SUMMARY

The Siebert Formation at Three Hills Mine consists of interlayered siltstones, sandstones, conglomerates, and tuffs. The coarser, more permeable sandstones and conglomerates are generally pervasively silicified and are the preferred hosts for gold mineralization. There are indications that the gold mineralization is found in veins and brecciated structures.

The gold recovery appears to be related to head grade and particle size. The coarser fractions, 1 inch to 12 inches, have a lower head grade of less than 0.010 opt and recoveries that vary from 20% to 50%. The size fractions that are less than 1 inch have head grades that vary from 0.025 opt to 0.040 opt and recoveries that vary from 60% to 80%. The test results indicate that the particles break along structure, thereby exposing the gold to leaching.

Using column leach test composites, a grade versus recovery curve was developed where:

- Gold Recovery = 0.1785ln(Gold Head Grade opt) + 1.5203

Other key parameters include:

- Leach time was estimated to be 171 days;
- Additional gold recovery may be possible with additional leach time;
- Cyanide consumption is predicted to be 0.45 lb/ton of ore; and
- Lime consumption is estimated at 4 lb/ton of ore;

13.5.2 THREE HILLS MINE - RECOMMENDATIONS

Lab-scale compacted permeability tests were performed by KCA in 2014 on tailings material from the surface sample ROM 48-inch diameter column, screened to -3 inch. The results of the test indicated that the flow rate at stack height of 200 feet was probably not sufficient, which could result in ponding on the heap or saturated lenses on lower lifts.

A comparison of the material sizing showed a higher proportion of fines in the percolation test sample when compared to the fines content of the McClelland test columns. The McClelland test columns had approximately half the amount of fines in the 10 mesh minus size that were in the KCA test column even after crushing to 1.5 inches.

A visual inspection of the core was performed during a site visit in October 2022. The core showed little if any sign of clay or excessive fines.

A visual inspection of the location where the bulk surface samples were collected was also performed during the same site visit. Two of the sites visited showed signs of weathered material.

Based on the site visit there are indications are that the core material below the surface is permeable and will percolate. Further permeability testing should be performed to confirm that the ROM ore can be mined, stacked, and leached and to confirm that the issues associated with the permeability of the 48-inch test column were caused by weathered surface material.

13.5.3 HASBROUCK MINE – SUMMARY

The Hasbrouck Mine is separated into two lithological packages, designated the Upper Siebert and the Lower Siebert. The Upper Siebert is dominated by sandstones and conglomerates and is heavily silicified. The Lower Siebert is dominated by lithic tuff with interbedded siltstones and sandstones. The contact between the Upper and Lower Siebert is gradational over a 50 to 100 feet elevation range due to over-lapping lithologies between the two units. Post-depositional faulting has produced vertical offsets of the modeled contact of up to 100 feet.

The difference in gold recoveries between the two Siebert stratigraphic units is most likely due to the degree of silicification of the ore. The Upper Seibert formation has gold recoveries that vary from 25% to 50%. The Lower Seibert formation has gold recoveries that vary from 60% to 85%.

Using 3/8 inch leach column results, a relationship between gold recovery, lithology and depth in the deposit was identified.

Additionally, it was noted that the gold recoveries for two formations are sensitive to crush size. For the Upper Seibert the difference between a 10 mesh bottle (0.079 inches) roll test and a 3/8 inch leach column test was 52% and 42% respectively. For the Lower Seibert the difference between a 10 mesh bottle roll test and a 3/8 inch leach column test was 73.4% and 69.6% respectively.

HPGR crushing was tested to see if it would selectively open microfractures which would allow cyanide access to planes of weakness in the rock. Size distribution for the bulk surface sample crushed material shows that the P80 decreases from 0.38 inches to 0.28 inches from a conventional crush to a HPGR crush. It appears that the increase in Upper Seibert gold recovery of 10% achieved by HPGR crushing of the bulk surface sample at a P80 of 0.28 inches closely matches the increase in recovery difference between 10 mesh (0.079 inches) bottle rolls and 3/8 inch leach columns. The bottle roll tests have a much finer grind size than HPGR crushing, indicating that the microfracture mechanism is effecting the gold recovery.

Similarly, it appears that the average Lower Seibert gold recovery increase of 5% of by HPGR crushing at a P80 of 0.28 inches closely matches the recovery achieved by 10 mesh (0.079 inches) bottle roll tests that have a much finer grind size, indicating that the microfracture mechanism is also effecting the gold recovery for this formation.

In summary, the HPGR crushed material from the Upper Seibert formation had an average recovery increase of 10% and the HPGR crushed material from the Lower Seibert formation had an increase in gold recovery of 5%. Similarly, silver recoveries increased by approximately 10% for the Upper Seibert and 3% for the Lower Seibert.

Gold recoveries for the Upper Seibert and Lower Seibert are defined by the following equations. Silver recovery is estimated from averages, which are enhanced by HPGR crushing.

Upper Seibert Gold Recovery = (0.0009 x depth in feet below the drill collar elevation) + 0.3206 + 0.10

Upper Seibert Silver Recovery = 24%.

Lower Seibert Gold Recovery = (0.0002 x depth in feet below the drill collar elevation) + 0.6412 + 0.05

Lower Seibert Silver Recovery = 17%.

Other key parameters include:

- Leach time was estimated to be 115 days;
- NaCN consumption is predicted to be 0.75 lb/ton; and
- Cement consumption is predicted to be 4 lb /ton.

14.0 MINERAL RESOURCE ESTIMATES

14.1 INTRODUCTION

This section is modified from Dyer et al. (2016). Mineral Resource estimation and classification described in this section for Three Hills and Hasbrouck mines was done in accordance with guidelines of Canadian Instrument 43-101 ("NI 43-101"). The modeling and estimation of gold and silver Mineral Resources were done under the supervision of Jeff Bickel, a Qualified Person under NI 43-101 with respect to Mineral Resource estimation. Mr. Bickel is independent of WVM by the definitions and criteria set forth in NI 43-101; there is no affiliation between Mr. Bickel and WVM except that of an independent consultant/client relationship.

Mr. Bickel classifies Mineral Resources in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured categories in accordance with the "CIM Definition Standards – For Mineral Resources and Mineral Reserves" (2014) and the Guidelines (2019) as required by NI 43-101. CIM Mineral Resource definitions are given below, with CIM's explanatory text shown in italics:

Mineral Resource

> *Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.*

A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

> *Material of economic interest refers to diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals.*
>
> *The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of Modifying Factors. The phrase 'reasonable prospects for eventual economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. The Qualified Person should consider and clearly state the basis for determining that the material has reasonable prospects for eventual economic extraction. Assumptions should include estimates of cutoff grade and geological continuity at the selected cut-off, metallurgical recovery, smelter payments, commodity price or product value, mining and processing method and mining, processing and general and administrative costs. The Qualified Person should state if the assessment is based on any direct evidence and testing.*
>
> *Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable*

> *to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time.*

Inferred Mineral Resource

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

> *An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.*

> *There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the Disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.*

Indicated Mineral Resource

An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

> *Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource Estimate is of sufficient quality to support a Pre-Feasibility Study which can serve as the basis for major development decisions.*

Measured Mineral Resource

A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

> *Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade or quality of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability of the deposit. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.*

Modifying Factors

Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

Mr. Bickel reports Mineral Resources at cut-offs that are reasonable for deposits of this nature given anticipated mining methods and plant processing costs, while also considering economic conditions, because of the regulatory requirements that a Mineral Resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction."

Although the author is not an expert with respect to any of the following factors, the author is not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the Hasbrouck Project Mineral Resources as of the date of this report.

14.2 THREE HILLS MINE

Three Hills Mine was modeled and estimated by evaluating the drill data statistically, interpreting mineral domains on cross sections and then orthogonal "long" sections, analyzing the modeled mineralization statistically to establish estimation parameters, and estimating gold grades into a three-dimensional block model. All modeling of Three Hills Mineral Resources was performed using Geovia Surpac™ software (version 6.6).

The Effective Date of the Three Hills Mineral Resource Estimate is December 15, 2022.

14.2.1 THREE HILLS MINE DATA

A geologic model for estimating the gold Mineral Resources at Three Hills Mine was created from drilling data generated by historical operators, over a period from 1974 through 2013. The Three Hills Mine Mineral Resource reported in this technical report is based on a project drill database consisting of 291 drill holes totaling 88,199ft. The majority of the drilling (273 total holes for 82,787ft) has been by some form of rotary percussion drilling (reverse circulation, rotary, air track). Eighteen diamond core holes for 5,412ft have been drilled on the Project.

The Three Hills Mine drill-hole assay database contains 14,884 gold assays, and 6,934 silver assays. Due to the generally low silver values, and subsequent minor impact on projected economics, only gold was estimated in the current Mineral Resource. All less-than-detection values were converted to "0" for use in the Mineral Resource Estimate.

The geology database includes drill-hole lithology and alteration data. Project digital topography was provided by WVM. These data were incorporated into a digital database using State Plane coordinates, Nevada West zone, NAD83 datum, expressed in US Survey feet.

WVM drilled three core holes for geotechnical purposes, ten RC exploration holes, and one water well which was logged and sampled for assay, in 2014. These drill data were received by RESPEC after completion of the current Mineral Resource Estimate. Mr. Bickel reviewed the data and determined that the 2014 drilling would have no material impact on the Mineral Resource model or estimate.

14.2.2 DEPOSIT GEOLOGY PERTINENT TO MINERAL RESOURCE MODELING

Three Hills Mine mineralization is contained primarily within the outcropping Siebert Formation with limited mineralization in the underlying Fraction Tuff. The Siebert Formation consists of interlayered siltstones, sandstones, conglomerates, and tuffs and the coarser, more permeable sandstones and conglomerates are generally pervasively silicified and are the preferred hosts for gold mineralization at Three Hills. The higher gold grades are associated with discontinuous, irregular 0.05- to 0.5inch-wide veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz.

The sub-horizontal to east-dipping contact between the Siebert and Fraction Tuff contains consistently higher grades of gold and is more commonly argillized than silicified. This contact zone controls mineralization lateral to the core of the deposit.

The drill-defined extent of Three Hills Mine gold mineralization is approximately 1,000ft east–west by 2,700ft north–south with a maximum depth of 500ft along the down-dip eastern edge of the deposit. Mineralization remains open at depth to the east and southeast along the Siebert-Fraction contact.

The Three Hills Mine is pervasively oxidized to the base of the drill-defined mineralization.

The water table was not encountered in drilling and the Mineral Resource is considered to be above the water table for future mine development.

14.2.3 THREE HILLS MINE GEOLOGIC MODEL

A cross-sectional geologic model of the Three Hills Mine was created by RESPEC that consisted of a total of 29 vertical, north-looking cross sections spaced at 100ft intervals across the deposit.

Using the interpreted drill data, along with the surface geology, the geologic model included the wall rock lithologies, with all apparent structural offsets, and the zones of moderate to strong silicification. The modeled lithologies included the Siebert Formation (Ts), the Fraction Tuff (Tf), the Brougher Rhyolite (Tbrt), and the Oddie Rhyolite (To). The resulting cross-sectional model was used as a template to guide the mineral-domain modeling (discussed below).

The lithology cross-sectional polygons were converted into three-dimensional solids which were used to code the block model on a block-in, block-out basis. The silicification polygons were three-dimensionally rectified to the drill data and vertical slices of the polygons were created at 20ft intervals orthogonal to the cross sections. The silicification zones were then modeled on 20ft-spaced long sections used to code the block model also on a block-in, block-out basis. The lithology solids and long-section silicification polygons were used to assign density values to the block model (see Section 14.2.6 for details on the block model density).

14.2.4 MINERAL-DOMAIN GRADE MODEL

The gold mineral domains were modeled on the same 29 east-west cross-sections as the geologic model. In order to define the mineral domains, the natural populations were first identified on quantile graphs that plot the gold-grade distributions of the drill-hole assays. This analysis led to the identification of low- (~0.004 to ~0.015 oz Au/ton), medium- (~0.015 to 0.04oz Au/ton), and high-grade (>~0.04 oz Au/ton) gold populations, assigned to domains 100, 200, and 300, respectively.

The drill-hole traces, topographic profile, and the lithology/alteration geologic interpretations were plotted on the sections with gold assays (colored by the grade-domain population ranges) plotted along the drill-hole traces, and these data were used as the base for the interpretations of the mineral domains. Mineral-domain envelopes were interpreted on the sections to more-or-less capture assays corresponding approximately to each of the defined grade populations.

Due to inconsistencies in the geologic logs of the historical RC holes, as well as the fact that essentially all subsurface geologic information is derived from RC chips, it was difficult to correlate the three mineral domains to specific geologic characteristics. In a general sense, medium-grade zones of mineralization (domain 200) typically are associated with moderate to strong pervasively silicified Siebert Formation, often containing thin silica veinlets. While high-grade assays occur both within narrow mineralized structural breccias that extend up into the Siebert and within the base of the Siebert just above the contact with the Fraction Tuff. The low-grade (domain 100) zones envelope the domain 200 mineralization, but they extend progressively further laterally away from the breccia.

Representative cross sections showing gold mineral-domain interpretations are in Figure 14-1 and Figure 14-2.

The cross-sectional mineral-domain polygons were digitized and then three-dimensionally rectified to the drill data. Vertical slices of the polygons were created at 20-foot intervals orthogonal to the cross sections, and the mineral domains were then modeled on 20-foot-spaced long sections. The final product of the long-section work is a set of 20-foot-spaced mineral-domain envelopes that three-dimensionally honor the drill data at the resolution of the block model.

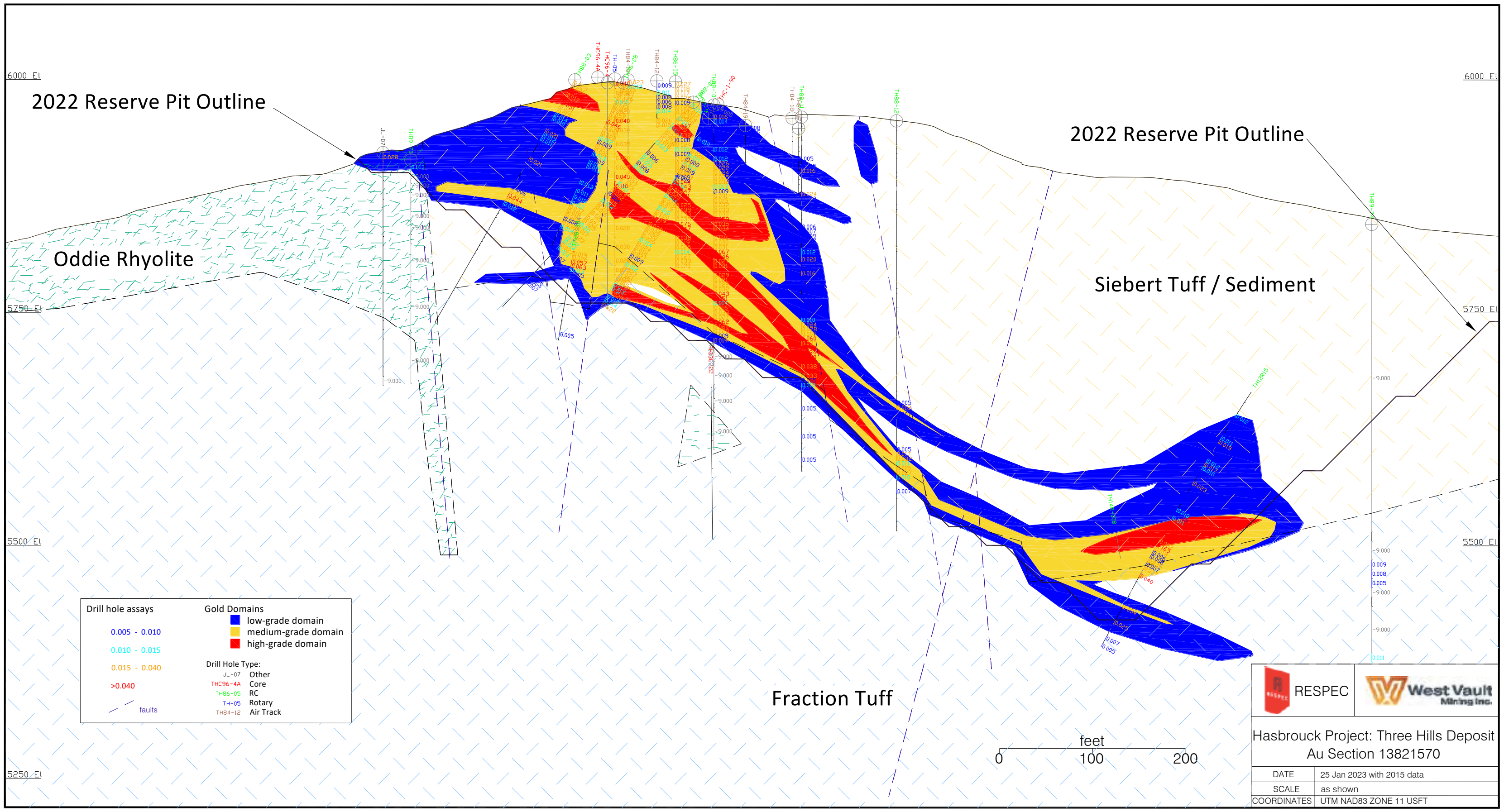

Figure 14-1. Three Hills Mine Section 13821570 Showing Geology and Gold Mineral Domains, Looking North
(Location of Section shown in Figure 7-9)

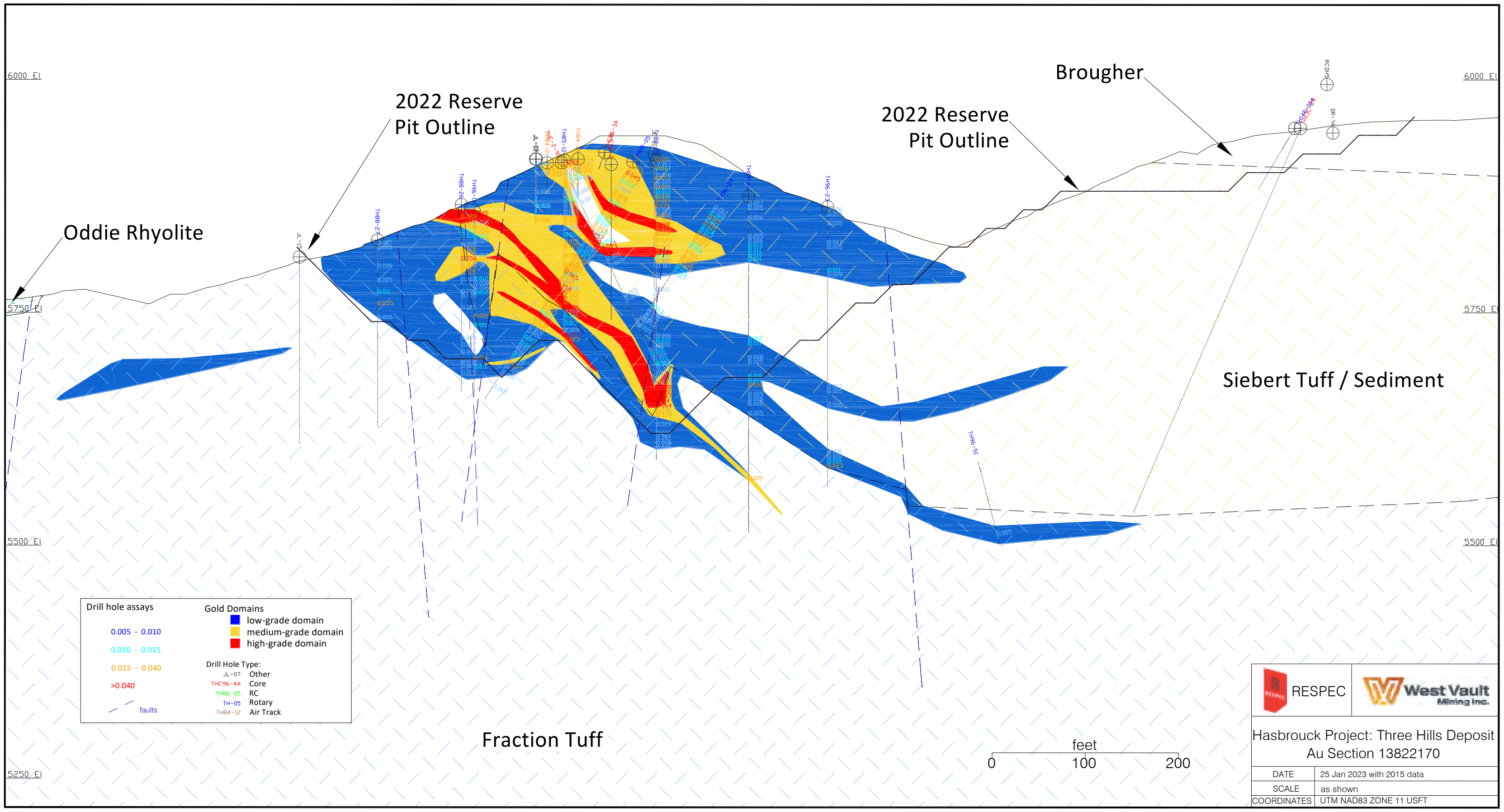

Figure 14-2. Three Hills Mine Section 13822170 Showing Geology and Gold Mineral Domains, Looking North
(Location of Section shown in Figure 7-9)

14.2.5 THREE HILLS MINE SAMPLE CODING AND COMPOSITING

Drill-hole assays were coded by the sectional mineral-domain polygons. Mr. Bickel analyzed the assay data and capped a total of 11 individual metal analyses which were statistically and spatially deemed beyond a given domain's natural population of samples. This number of samples capped represents approximately 0.25% of the total domain-coded assay values within the database. The capped analyses occur within all grade ranges and all estimation areas. Descriptive statistics of the uncapped and capped sample grades by domain are presented in Table 14-1.

Compositing was made at 20ft down-hole lengths, honoring all mineral domain boundaries. Length-weighted composites were used in the block-model grade estimation and the volume inside each mineral domain was estimated using only composites from inside that domain. Composite descriptive statistics for the metal domains are presented in Table 14-2.

Table 14-1. Three Hills Mine Mineral Domain Assay Statistics

Domain	Assays	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev	CV	Min oz (Au/ton)	Max oz Au/ton)	# Capped
100	Au	2517	0.008	0.006	0.006	0.780	0.000	0.122	4
	Au Cap	2517	0.008	0.006	0.005	0.680	0.000	0.050	
200	Au	1566	0.022	0.020	0.013	0.560	0.000	0.259	3
	Au Cap	1566	0.022	0.020	0.011	0.480	0.000	0.090	
300	Au	413	0.093	0.060	0.137	1.470	0.012	1.607	4
	Au Cap	413	0.088	0.060	0.097	1.090	0.012	0.700	
All	Au	4496	0.021	0.011	0.048	2.350	0.000	1.607	11
	Au Cap	4496	0.020	0.011	0.037	1.870	0.000	0.700	

Table 14-2. Three Hills Mine Mineral Domain Composite Statistics

Domain	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev	CV	Min (oz Au/ton)	Max (oz Au/ton)
100	848	0.008	0.007	0.004	0.470	0.000	0.035
200	572	0.022	0.021	0.007	0.330	0.000	0.053
300	187	0.088	0.064	0.072	0.820	0.017	0.700
All	1607	0.020	0.012	0.032	1.590	0.000	0.700

14.2.6 DENSITY

The density database consists of 112 density measurements on core samples collected during the 1996 and 2013 core drilling programs. The samples were from all significant rock types and gold grade ranges, and the procedures used the water immersion method.

Mr. Bickel analyzed the data and the general statistics by modeled rock type and gold mineral domain. After reviewing the data, two samples were removed due to spurious results. The tonnage factor statistics (in cubic feet per ton units) for the remaining 110 samples are shown in Table 14-3. Due to the often highly fractured nature of the deposit, and the fact that voids resulting from many of the open fractures cannot be accurately reflected in density determinations, the measured density values were factored up by 1% to 2% to account for the unavoidable sample-selection bias. The factored data, shown in the "Model TF" column in Table 14-3, reflect the actual tonnage factor values assigned to the Three Hills block model.

Table 14-3. Descriptive Statistics of Three Hills Mine Tonnage Factor (ft^3/ton) Values by Rock Type

Rock Type	Count	Mean	Median	Min.	Max.	Std. Dev.	Model TF
Tbrt	1	14.43	14.43	14.43	14.43		14.60
To	23	14.48	14.53	13.60	15.25	0.45	14.65
Tf	21	15.56	15.34	14.12	17.12	0.90	15.60
Ts (non-silicic)	27	15.98	15.66	14.34	18.09	1.02	16.00
Ts (silicic)	27	14.30	14.12	12.62	16.27	0.95	14.50
100200300 (non-silicic)	11	15.33	15.10	13.93	17.47	0.98	15.50

14.2.7 THREE HILLS MINE BLOCK MODEL CODING

The 20ft-spaced long-sectional mineral-domain polygons were used to code a north-south three-dimensional block model that is comprised of 20ft (width) x 20ft (length) x 20ft (height) blocks. In order for the block model to better reflect the irregularly shaped limits of the various gold domains, as well as to explicitly model dilution, the percentage volume of each mineral domain within each block is stored (the "partial percentages").

Lithology and silicification are coded into the block model on a block-in/block-out basis. The percentage of each block that lies below the topographic surface is also stored. Each block is assigned a tonnage factor listed on Table 14.3 based on its coded lithology, silicification, and mineral domain.

14.2.8 MINERAL RESOURCE MODEL AND ESTIMATION

The Mineral Resource Estimate reflects the general northerly trend and variably east-dipping nature of the Three Hills Mine gold mineralization. To replicate the change in orientation observed within the deposit, two search-ellipse orientations were used to control the Mineral Resource Estimate. The first orientation (designated Area 10) represents the generally horizontal nature of the near-surface, low- and mid-grade mineralization within the Siebert Formation. The second orientation area (Area 20) is coded into the block model using a solid and represents the deeper mineralization that occurs along the east-dipping Siebert/Fraction Tuff contact. See Table 14-4 for the search ellipse parameters.

Table 14-4. Three Hills Search Ellipse Orientations

Est. Area	Azimuth	Plunge	Tilt
10	0	0	0
20	0	0	-35

Grade interpolation utilized Inverse Distance Cubed (ID3), with nearest neighbor and ordinary kriging estimates also being made for checking estimation results and sensitivities. Variography and geostatistical evaluations were made to determine distances for search and classification criteria. The estimation parameters applied at Three Hills are summarized in Table 14-5. The estimation used two search passes with successive passes not overwriting previous estimation passes. The first-pass search distances take into consideration the results of both the variography and drill-hole spacing. The second pass was designed to estimate grade into all blocks coded to the mineral domains that were not estimated in the first pass.

The estimation passes were performed independently for each of the mineral domains, so that only composites coded to a particular domain were used to estimate grade into blocks coded by that domain. The estimated grades were coupled with the partial percentages of the mineral domains to enable the calculation of a single weight-averaged block-diluted grade for each block.

Table 14-5. Summary of Three Hills Mine Estimation Parameters

Estimation Parameters: Gold Domains 100+200+300						
	Search Ranges (ft)			Composite Constraints		
Estimation Pass	Major	Semi-Major	Minor	Min	Max	Max/hole
1 (area 10)	200	150	100	2	15	3
1 (area 20)	200	133	67	2	15	3
2	500	500	500	1	18	3

14.2.9 THREE HILLS MINE MINERAL RESOURCES

The author classified Three Hills Mineral Resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology (Table 14-6). There are no Measured Resources due to the general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to historical drill hole locations. Indicated Mineral Resources are limited to the near-surface, north-south core of the deposit. The mineralization at depth along the east side of the deposit and the scattered mineralization to the northwest are considered Inferred only.

Table 14-6. Three Hills Mine Classification Parameters

Class	Estimation Pass	Min. Number of Drill holes	Min. Number of Composites	Avg. Dist. to Nearest 2 Composites
Indicated	1	2	2	100
Inferred	all other modeled mineralization			
*only within north-south oriented center of deposit				

To meet the requirement of the Mineral Resources having reasonable prospects for eventual economic extraction, a pit optimization was completed using the parameters summarized in Table 14-7. The recovery applied to the optimization varies by formation and depth, as per the discussion in section 13.

Table 14-7. Three Hills Mine Pit Optimization Cost Parameters

Parameters	Values Used	Unit
Mining Cost	2.39	$/ton mined
Processing Cost	2.98	$/ton processed
G&A Cost	0.42	$/ton processed

Parameters	Values Used	Unit
Average Au Recoveries	Rec_{gold} =min (0.925, (0.1786 * ln (grade in opt) + 1.5203) - 0.025)	
Au Price	1850	$/oz produced
Royalty	2.38	NSR

1. Mineral Resources for Three Hills Mine are estimated using a 0.005oz Au/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1,850 per ounce, a mining cost of $2.39/ton mined, a processing cost of $2.98/ton processed, a grade-dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.42/ton processed, and a 2.38% NSR Royalty.
2. The Effective Date of the Mineral Resource estimations is December 15, 2022.
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Indicated Mineral Resources are reported inclusive of Mineral Reserves.
5. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration.
6. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.
7. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained gold content.

The Three Hills Mine Mineral Resources are inclusive of Mineral Reserves and listed in Table using a cut-off grade of 0.005 oz Au/ton. The cut-off was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. The block-diluted Mineral Resources are also tabulated at additional cut-offs in order to provide grade-distribution information, as well as to provide for economic conditions other than those envisioned by the 0.005 oz Au/ton cut-off (Table 14-9). Three Hills Mineral Resources have an Effective Date of December 15, 2022.

Figure 14-3 and Figure 14-4 show cross sections of the block model that correspond to the mineral-domain cross sections in Figure 14-1 and Figure 14-2, respectively.

Table 14-8. Three Hills Mine Reported Mineral Resources (0.005oz Au/ton Cut-off)

Three Hills Mine Mineral Resources			
Indicated			
Material	K Tons	oz Au/ton	K oz Au
Total	10,423	0.018	185
Inferred			
Material	K Tons	oz Au/ton	K oz Au
Total	1,008	0.017	17

1. Mineral Resources for Three Hills Mine are estimated using a 0.005oz Au/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1850 per ounce, a mining cost of $2.39/ton mined, a processing cost of $2.98/ton processed, a grade-dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.42/ton processed, and a 2.38% NSR Royalty.
2. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
3. Indicated Mineral Resources are reported inclusive of Mineral Reserves.
4. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration.
5. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
6. The Effective Date of the Mineral Resource estimations is December 15, 2022.
7. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

Table 14-9. Three Hills Mine Mineral Resources

Indicated			
oz Au/ton Cutoff (ID)	K Tons	oz Au/ton	K oz Au
0.005	***10,423***	***0.018***	***185***
0.006	9,722	0.019	182
0.007	8,866	0.020	177
0.008	7,985	0.021	171
0.009	7,224	0.023	165
0.01	6,587	0.024	159
0.011	6,107	0.025	154
0.012	5,707	0.026	150
0.013	5,389	0.027	146
0.014	5,087	0.028	142
0.015	4,814	0.029	138
0.02	3,380	0.034	114
0.03	1,418	0.047	67
0.05	409	0.073	30
Inferred			
oz Au/ton Cutoff (ID)	K tons	oz Au/ton	K oz Au
0.005	***1,008***	***0.017***	***17***
0.006	831	0.020	16
0.007	639	0.024	15
0.008	485	0.029	14
0.009	383	0.035	13
0.01	296	0.042	12
0.011	252	0.048	12
0.012	220	0.053	12
0.013	199	0.057	11
0.014	182	0.061	11
0.015	169	0.065	11
0.02	115	0.088	10
0.03	71	0.129	9
0.05	58	0.149	9

1. The project Mineral Resources are shown in bold and italics and are comprised of all model blocks at a 0.005 oz Au/ton cutoff that lie within optimized Mineral Resource pits;
2. Tabulations at higher cutoffs than used to define the Mineral Resources represent subsets of the Mineral Resources;
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability;
4. Indicated Mineral Resources are reported inclusive of Mineral Reserves.
5. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration; and
6. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.

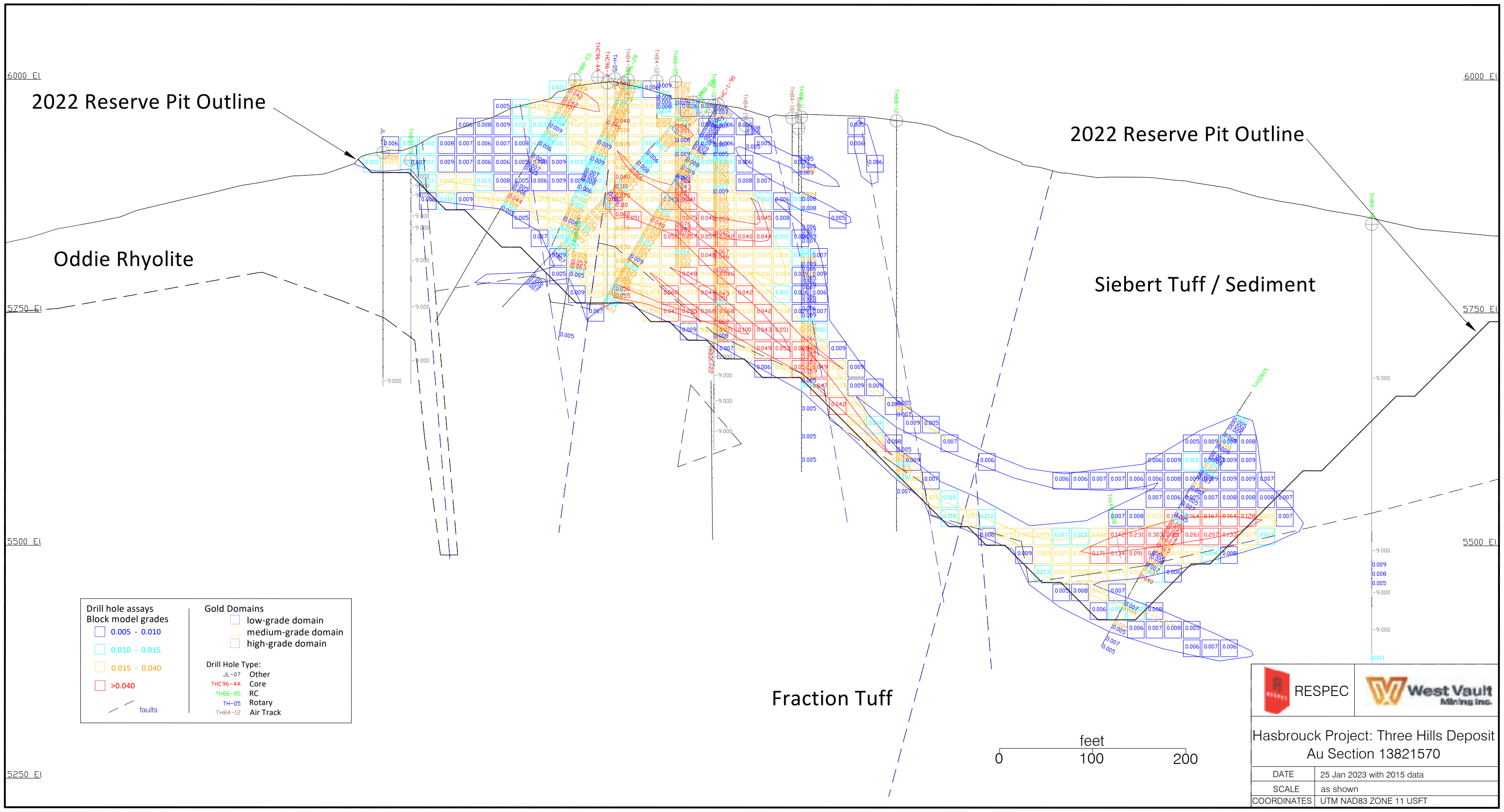

Figure 14-3. Three Hills Mine Section 13821570 Showing Block Model Gold Grades (Looking North)

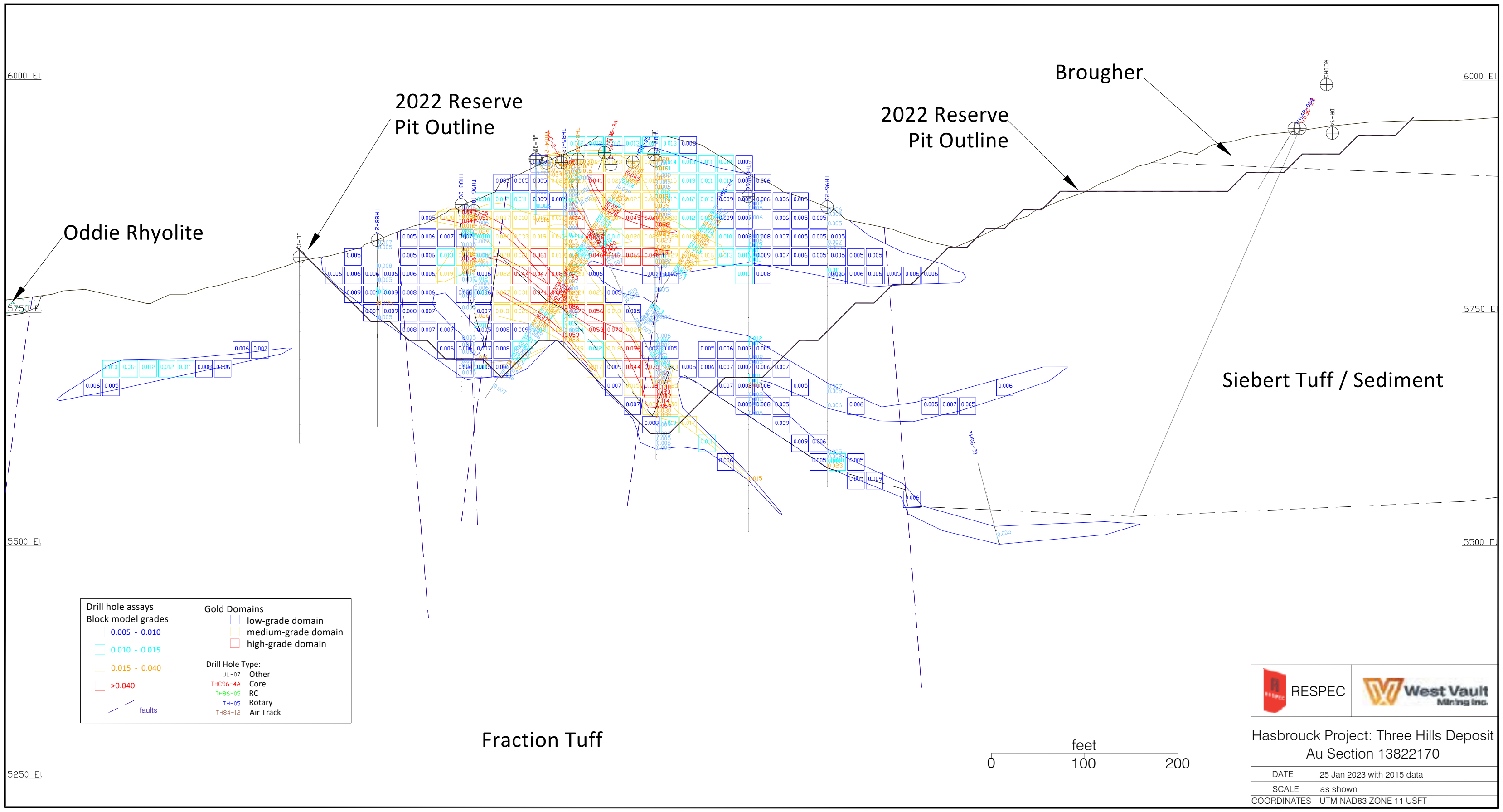

Figure 14-4. Three Hills Mine Section 13822170 Showing Block Model Gold Grades (Looking North)

14.2.10 MODEL CHECKS

Volumes indicated by the sectional mineral-domain modeling were compared to the long-section volumes and those coded to the block model to assure close agreement, and all block-model coding was checked visually on the computer. Nearest-neighbor and ordinary-krige estimates of the Three Hills Mine Mineral Resources were undertaken as a check on the inverse-distance-cubed Mineral Resource model. Grade-distribution plots of assays and composites versus the nearest-neighbor, krige, and inverse-distance block grades were also evaluated as a check on the estimation. Finally, the inverse-distance grades were visually compared to the drill-hole assay data to assure that reasonable results were obtained.

14.2.11 COMMENTS ON THREE HILLS MINERAL RESOURCE MODELING

The Three Hills Mine gold Mineral Resource is based on drill-sample analyses, density measurements, logged silicification content, and lithologic and structural geologic contacts. At a 0.005oz Au/ton cut-off, Three Hills mineralization consists of a single, irregularly shaped deposit that extends for more than 2,700ft north-south and 1,000ft east-west. Mineralization remains open at depth to the east and southeast along the Siebert-Fraction contact.

Mineralization at Three Hills Mine is similar in style to that at Hasbrouck Mine, though the degree and spatial extent of silicification and brecciation/veining is smaller and generally not as well developed.

There are no Measured Mineral Resources at Three Hills Mine due to a general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to historical drill hole locations. Indicated Mineral Resources are limited to the near-surface, north-south core of the deposit.

The core of the deposit is relatively well-defined and infill drilling is not expected to materially change the current Mineral Resource model and estimate. Additional drilling on the periphery of the deposit, including following up on the 2014 drill program completed by WVM on the southeast edge of the deposit, has the potential to upgrade the classification of the existing Inferred Mineral Resource and to expand the Mineral Resource to the east and southeast.

14.3 HASBROUCK MINE

The Hasbrouck Mine was modeled and estimated by evaluating the drill data statistically, interpreting mineral domains on cross sections and then level plans, analyzing the modeled mineralization statistically to establish estimation parameters, and estimating gold and silver grades into a three-dimensional block model. All modeling of the Hasbrouck Mineral Resources was performed using Geovia Surpac™ software, (version 6.6).

The Effective Date of the Hasbrouck Mine Mineral Resource Estimate is December 15, 2022.

14.3.1 DATA

A geologic model for estimating the gold and silver Mineral Resources at Hasbrouck was created from drilling data generated by historical operators over a period from 1974 through 2012. The Hasbrouck Mine Mineral Resource reported in this technical report is based on a project drill database consisting of 317 drill holes totaling 216,761ft. The majority of the drilling (252 total holes for 179,174ft) has been by reverse circulation (RC) while 43 diamond core holes for 28,607ft and 22 air-track holes for 8,980ft have also been drilled on the project.

The Hasbrouck drill-hole assay database contains 42,150 gold assays, and 42,143 silver assays. Both gold and silver were estimated in the current Mineral Resource. Also included in the database are 14,201 gold and 13,782 silver cyanide leach analyses. All less-than-detection values were converted to "0" for use in the Mineral Resource Estimate.

The database includes the 191 underground samples collected by Cordex in 1980 from the Main, Ore Car, South, and Northeast adit underground workings. These data have been used to guide the development of the geology and gold mineral model, but the gold and silver assay data has not been used in the estimation of Mineral Resources presented in this Technical Report because of lack of knowledge of collection technique and the inability to verify assay values.

The geology database includes drill-hole lithology and alteration data. Project digital topography was provided by WVM. These data were incorporated into a digital database using State Plane coordinates, Nevada West zone, NAD83 datum, expressed in US Survey feet.

WVM drilled 14 RC exploration holes located south, southeast, and north of the current Mineral Resource model in 2014. These drill data were received by RESPEC after completion of the current Mineral Resource Estimate. Mr. Bickel reviewed the data and determined that the 2014 drilling would have no material impact on the Mineral Resource model or estimate.

14.3.2 DEPOSIT GEOLOGY PERTINENT TO MINERAL RESOURCE MODELING

A geologic model for estimating the gold and silver Mineral Resources at Hasbrouck was created from drilling data generated by historical operators, over a period from 1974 through 2012. The Hasbrouck Mine Mineral Resource reported in this technical report is based on project drill database consisting of 317 drill holes totaling 216,761ft. The majority of the drilling (252 total holes for 179,174ft) has been by reverse circulation (RC); 43 diamond core holes for 28,607ft and 22 air-track holes for 8,980ft have also been drilled on the project.

The precious metals mineralization at Hasbrouck is concentrated within the Siebert Formation, stratigraphically below the chalcedonic sinter horizons that outcrop near the peak of Hasbrouck Mountain.

The upper portion of the Siebert Formation is dominated by volcaniclastic sedimentary rocks, mostly sandstones and conglomerates. Beneath Hasbrouck Mountain, the Upper Siebert has a maximum thickness of about 300ft and the base of the Upper Siebert is generally marked at the bottom of the lower-most conglomerate. The lower portion of the Siebert Formation consists predominantly of various lithic, crystal and lapilli ash-flow units with interbedded volcaniclastic sedimentary units, primarily sandstone and siltstone. The Lower Siebert lithologies crop out along drill roads along the north, east, and south flanks of Hasbrouck Mountain. The upper/Lower Siebert contact is not a smooth plane but is disrupted by numerous north-south and northwest-directed faults that have 50 to 100ft of apparent vertical offset.

The mineralization at Hasbrouck is accompanied by strong pervasive silicification, with associated adularia and pyrite, within both the volcaniclastic rocks and tuffaceous units of the Siebert Formation. Pervasive silicification and hydrothermal brecciation/veining is common within the Upper Siebert and the top of the Lower Siebert. Silicification and veining decrease and are increasingly structurally-controlled at depth within the Lower Siebert tuffaceous and fine-grained sedimentary rocks. Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones and is most common in the Lower Siebert tuffaceous rocks.

The Kernick structure, which was the focus of the historical underground production at Hasbrouck, strikes roughly east-west across Hasbrouck Mountain and dips to the north. Although the Kernick structural zone is mineralized, the bulk of the mineralization in the deposit occurs in the hanging wall of the structure and consists principally of millimeter- to centimeter-scale, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with multiple, larger coalesced, but erratic bodies of hydrothermal breccias. The sheeted vein and enclosing hydrothermal breccias are interpreted to be dominantly near-vertical, west-northwest trending zones. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent throughout the deposit, but is especially evident in many of the moderate-grade zones along the peripheries of the deposit. A minor amount of mineralization lies in the footwall of the Kernick structure along probable smaller, subsidiary structural zones.

At a 0.006oz Au/ton cut-off, Hasbrouck mineralization consists of a single, irregularly shaped deposit that extends for more than 2,500ft in an east-west and about 2,400ft in a north-south direction. The silver mineralization outline at a 0.25oz Ag/ton cut-off is similar to the gold outline, although it is less extensive. Mineralization remains open at depth along the intersection of the cross-cutting structural fabrics. However, deeper drilling in the Fraction Tuff has yet to intersect significant mineralization.

Oxidation: The Hasbrouck mineralization is predominantly oxidized though isolated zones of minor (<1 percent sulfide) remnant sulfides can occur throughout the deposit. The partially oxidized sulfidic mineralization generally is associated with areas of strong pervasive silicification or within thin silica veins. Due to the irregular and varying nature of oxidation, and also the irregular distribution of the cyanide leach data, a unique oxidation model was not completed.

As discussed in Section 13.0, metallurgical tests indicate that the upper and Lower Siebert have different gold extraction characteristics possibly related to the degree of silicification within these two stratigraphic horizons.

Groundwater: The water table was not encountered in drilling. The Mineral Resource is considered to be above the water table and ground water is not expected to be a factor in future mine development.

14.3.3 LITHOLOGY/ALTERATION MODEL

A cross-sectional lithologic/structural model of the Hasbrouck Mine was created based on north-looking cross sections spaced at 100-foot intervals.

Using the interpreted drill data and surface geology, the lithology model included the wall rock lithologies, with all apparent structural offsets. The modeled lithologies included the upper and lower portions of the Siebert Formation (Tsus and Tslt, respectively), the Fraction Tuff (Tf), and the young Tertiary volcanics/sinter/Quaternary colluvium unit which overlie the Siebert Formation in the west-center portion of Hasbrouck hill. These post-Siebert lithologies are a small, fault-bounded erosional remnant that appears to be post-mineral. The lower portion of the Siebert Formation was not modeled but is considered the "default" lithology within the model.

The volcaniclastic-dominant Upper Siebert Formation and Fraction Tuff lithology cross-sectional polygons were converted into three-dimensional solids which were used to code the block model.

Using the lithology solids as a guide, zones of moderate to strong silicification were modeled on 28 west-looking cross-sections spaced at 100-foot intervals with the spacing decreasing to 50-foot within the west-center of the deposit. The resulting cross-sectional model was used as a template to guide the mineral-domain modeling (discussed below).

The Tertiary volcanic/Quaternary alluvium and silicification polygons were three-dimensionally rectified to the drill data and vertical slices of the polygons were created orthogonal to the cross sections. The volcanic and silicification zones were then modeled on 10-foot- and 20-foot-spaced level plans, respectively, used to code the block model. The lithology solids and level plans were used to assign density values to the block model (see Section 14.3.6 for details on the block model density).

14.3.4 MINERAL-DOMAIN GRADE MODEL

A mineral domain is a natural grade population of a metal that occurs within a specific geologic setting. In order to define the mineral domains, the natural populations were first identified on quantile graphs that plot the metal-grade distributions of the drill-hole assays. This analysis led to the identification of low- (~0.004 to ~0.015 oz Au/ton), medium- (~0.015 to 0.07oz Au/ton), and high-grade (>~0.07 oz Au/ton) gold populations, assigned to domains 100, 200, and 300, respectively. Two silver populations were identified, low (~0.25 to ~1.0oz Ag/ton) and medium (>~1.0oz Ag/ton), assigned to domains 100 and 200, respectively. Ideally, each of these populations can be correlated with specific geologic characteristics that are captured in the project database to aid in the definition of the mineral domains.

The gold and silver mineral domains were modeled on the same west-looking cross-sections as the silicification model. The drill-hole traces, topographic profile, and the lithology/alteration geologic interpretations were plotted on the sections with gold and silver assays (colored by the grade-domain population ranges) plotted along the drill-hole traces, and these data were used as the base for interpretations of the mineral domains. Mineral-domain envelopes for each metal were interpreted on the sections to capture assays corresponding approximately to each of the defined grade populations.

Medium-grade zones of mineralization (gold domain 200) typically are associated with pervasively silicified Siebert Formation commonly containing thin silica veinlets. The silicified Siebert wall rock hosts the high-grade mineralization (gold domain 300) which occurs primarily within narrow, near-vertical mineralized structural breccias or zones that extend up through the Siebert. The low-grade (domain 100) zones envelope the domain 200 mineralization and extend outwards from the breccia. In general, the low-grade silver domain is spatially associated with the mid-grade gold domain and the mid-grade silver domain 200 is associated with the high-grade gold domain.

Erratic low-grade gold and silver mineralization occurs within the post-mineral lithologies (Tertiary volcanic/Quaternary alluvium) that occur as erosional remnants on the west side of Hasbrouck Mountain. The mineralization within these units occurs primarily as mineralized cobbles and boulders that have eroded off the exposed mineralized Siebert formation. A unique mineral domain (domain 10 for gold and silver) was created so that grade estimation is constrained within this mineral type.

Representative cross sections showing gold mineral-domain interpretations are presented in Figure 14-5 and Figure 14-6. Silver are shown in Figure 14-7 and Figure 14-8.

The cross-sectional mineral-domain polygons were digitized and then three-dimensionally rectified to the drill data. The rectified polygons were sliced at 10-foot vertical intervals and the mineral domains were then modeled on 10-foot-spaced level plans. The final product of the level plan work is a set of 10-foot-spaced mineral-domain envelopes that three-dimensionally honor the drill data at twice the resolution of the 20-foot block model. The 10-foot level plan intervals were chosen to ensure that the occasional thin, sub-horizontal mineral zones are coded into the block model.

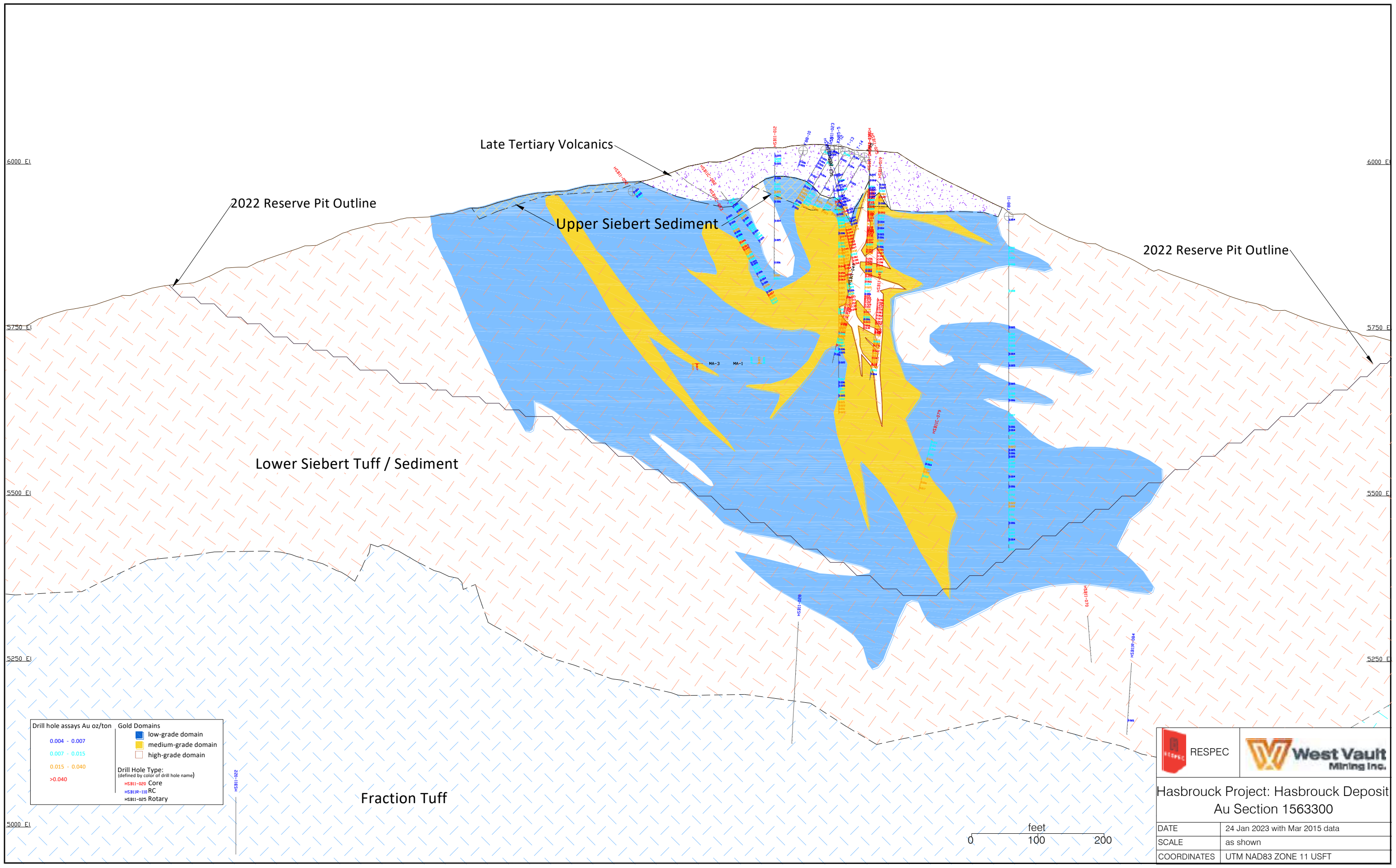

Figure 14-5. Hasbrouck Mine Section 1563300 Showing Geology and Gold Mineral Domain (Looking West)

Figure 14-6. Hasbrouck Mine Section 1563700 Showing Geology and Gold Mineral Domain (Looking West)

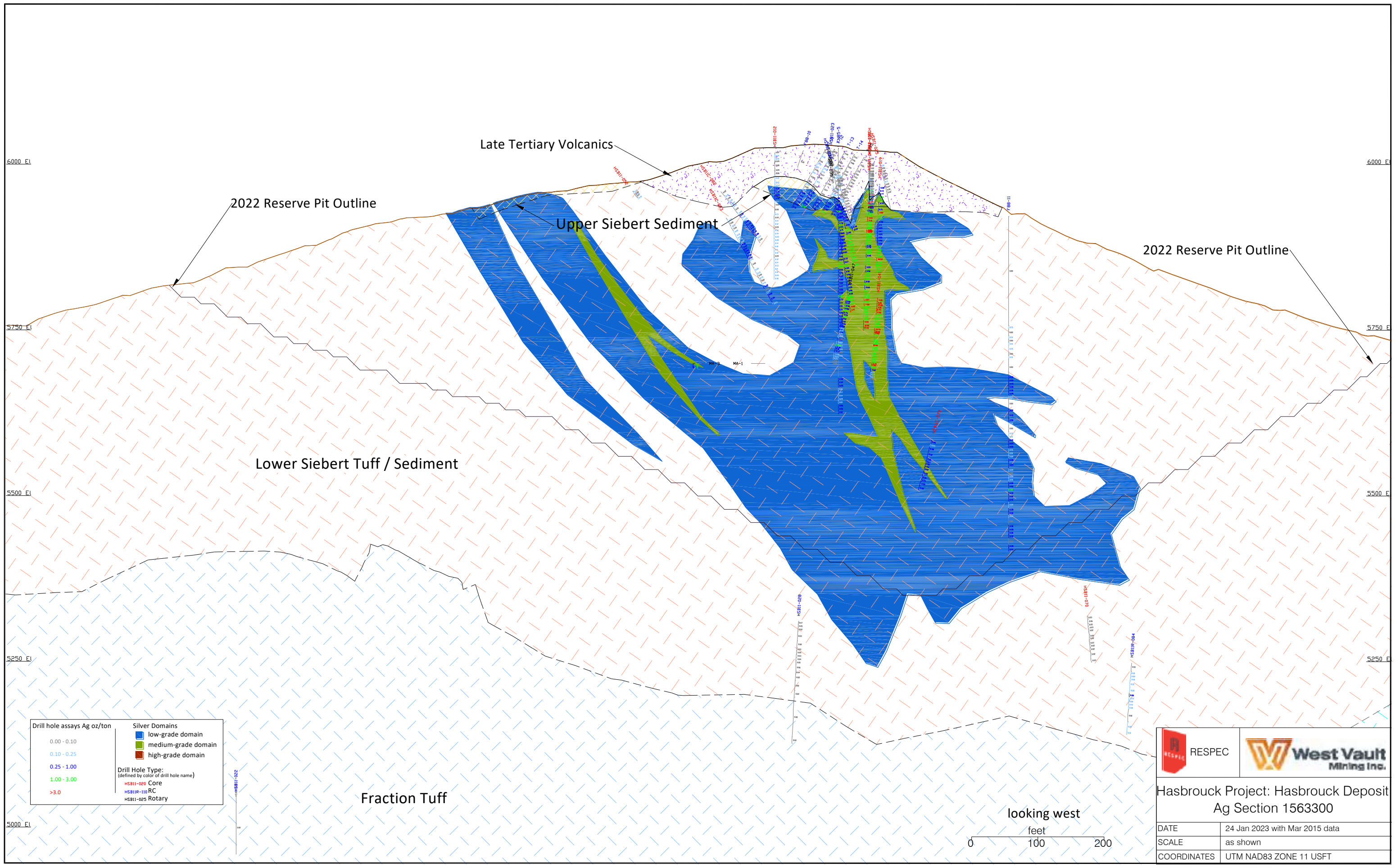

Figure 14-7. Hasbrouck Mine Section 1563300 Showing Geology and Silver Mineral Domain (Looking West)

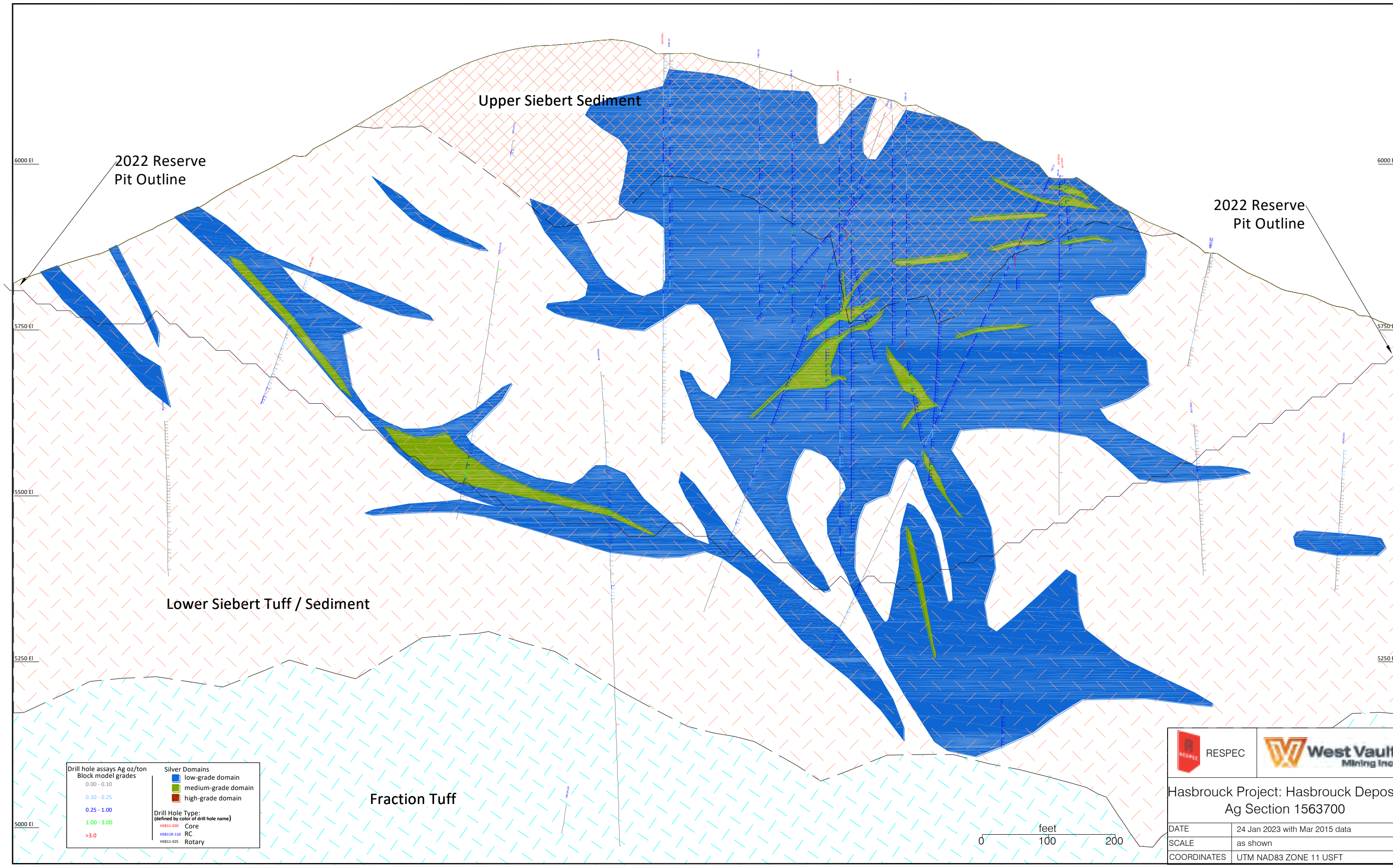

Figure 14-8. Hasbrouck Mine Section 1563700 Showing Geology and Silver Mineral Domain (Looking West)

14.3.5 SAMPLE CODING AND COMPOSITING

Drill-hole assays were coded by the sectional mineral-domain polygons. The author analyzed the assay data and capped a total of 24 individual metal analyses which were statistically and spatially deemed beyond a given domain's natural population of samples. This number of samples capped represents less than 0.1% of the total domain-coded assay values within the database. The capped analyses occur within all grade ranges and all estimation areas. Descriptive statistics of the uncapped and capped sample grades by domain are presented in Table 14-10.

Compositing was made at 20ft down-hole lengths, honoring all mineral domain boundaries. Length-weighted composites were used in the block-model grade estimation and the volume inside each mineral domain was estimated using only composites from inside that domain. Composite descriptive statistics for the metal domains are presented in Table 14-11.

Table 14-10 Hasbrouck Mineral Domain Assay Statistics

Au Domain	Assays	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev	CV	Min (oz Au/ton)	Max (oz Au/ton)	# Capped
10	Au	331	0.005	0.003	0.005	1.090	0.000	0.039	
	Au Cap	331	0.005	0.003	0.005	1.090	0.000	0.039	
100	Au	9880	0.007	0.006	0.006	0.880	0.000	0.116	7
	Au Cap	9880	0.007	0.006	0.006	0.860	0.000	0.070	
200	Au	5072	0.025	0.020	0.024	0.970	0.000	0.849	8
	Au Cap	5072	0.024	0.020	0.018	0.760	0.000	0.200	
300	Au	434	0.168	0.097	0.285	1.690	0.012	3.165	7
	Au Cap	434	0.153	0.097	0.173	1.130	0.012	1.000	
All	Au	15717	0.017	0.009	0.054	3.220	0.000	3.165	22
	Au Cap	15717	0.016	0.009	0.038	2.330	0.000	1.000	

Ag Domain	Assays	Count	Mean (oz Ag/ton)	Median (oz Ag/ton)	Std. Dev	CV	Min (oz Ag/ton)	Max (oz Ag/ton)	# Capped
10	Ag	329	0.110	0.080	0.140	1.320	0.000	1.140	
	Ag Cap	329	0.110	0.080	0.140	1.320	0.000	1.140	
100	Ag	8894	0.370	0.320	0.230	0.630	0.000	2.410	
	Ag Cap	8894	0.370	0.320	0.230	0.630	0.000	2.410	
200	Ag	980	1.990	1.340	2.300	1.160	0.000	66.210	2
	Ag Cap	980	1.980	1.340	2.170	1.100	0.000	20.000	
All	Ag	10203	0.510	0.350	0.860	1.690	0.000	66.210	2
	Ag Cap	10203	0.510	0.350	0.830	1.630	0.000	20.000	

Table 14-11 Hasbrouck Mineral Domain Composite Statistics

Au Domain	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev	CV	Min (oz Au/ton)	Max (oz Au/ton)
10	105	0.004	0.004	0.004	0.790	0.000	0.019
100	2842	0.007	0.007	0.004	0.590	0.000	0.070
200	1481	0.024	0.022	0.012	0.500	0.001	0.165
300	157	0.153	0.105	0.120	0.790	0.027	0.697
All	4585	0.016	0.009	0.031	1.920	0.000	0.697

Ag Domain	Count	Mean (oz Ag/ton)	Median (oz Ag/ton)	Std. Dev	CV	Min (oz Ag/ton)	Max (oz Ag/ton)
10	106	0.110	0.080	0.110	1.060	0.000	0.740
100	2547	0.370	0.340	0.180	0.490	0.000	1.310
200	326	1.980	1.440	1.720	0.870	0.300	18.460
All	2979	0.510	0.350	0.720	1.410	0.000	18.460

14.3.6 DENSITY

The density database consists of 344 density measurements on core samples collected by Allied Nevada during the 2010 and 2011 core drilling programs. The samples were from all significant rock types and gold grade ranges, and the procedures used the water immersion method.

The author analyzed the data and the general statistics by modeled rock type and gold mineral domain. After reviewing the data, four samples were removed due to spurious results or potential sampling bias. The tonnage factor statistics (in cuft/ton units) for the remaining 340 samples are shown in Table 14-12. Due to the often highly fractured nature of the deposit, and the fact that voids resulting from many of the open fractures cannot be accurately reflected in density determinations, the measured density values were factored up by 1% to 2% to account for the unavoidable sample-selection bias. The factored data, shown in the "Model TF" column in Table 14.11, reflect the actual tonnage factor values assigned to the Hasbrouck block model.

Table 14-12. Descriptive Statistics of Hasbrouck Tonnage Factor (cuft/ton) by Rock Type

Rock Type	Count	Mean	Median	Min.	Max.	Std. Dev.	Model TF
Tvf/ Qal	14	17.15	17.32	12.76	21.08	3.08	17.58
Non-silicified	65	15.94	16.18	12.81	20.15	1.57	16.23
Au_100200300 (non-silicic)	60	14.38	13.99	12.61	18.31	1.37	14.35
Silicified	201	13.23	13.08	12.32	17.60	0.77	13.33

14.3.7 UNDERGROUND WORKINGS

RESPEC was provided the plan maps of the historical underground workings associated with the Kernick structure (Main adit) along with the more limited workings developed on the SE adit, NE adit and the Ore Car Adit. Modeled solids of the Kernick and

Ore Car workings were also provided. The location of the underground workings were used to guide the mineral domain modeling and also incorporated the workings into the block model to account for the volume loss. The latter volume loss, although minor at <1% of total deposit volume, is coded into the block model as the percentage of each block containing underground workings or stopes.

14.3.8 BLOCK MODEL CODING

The 10-foot-spaced level plan mineral-domain polygons were used to code a three-dimensional block model that is comprised of 20 foot (width) x 20 foot (length) x 20 foot (height) blocks. Each 20-foot high block is coded using the average volume of the two 10-foot-spaced levels. In order for the block model to better reflect the irregularly shaped limits of the various gold and silver domains, as well as to explicitly model dilution, the percentage volume of each mineral domain within each block is stored (the "partial percentages").

Lithology and silicification are coded into the block model on a block-in/block-out basis. The block model also contains a "rock_pct" attribute that is the percentage of each block that lies below the topographic surface minus the percentage of each block containing underground workings or stopes.

Each block is assigned a tonnage factor listed on Table 14-12 based on its coded lithology, silicification, and mineral domain.

14.3.9 MINERAL RESOURCE MODEL AND ESTIMATION

The Mineral Resource Estimate reflects the general west-northwest trend and variably-dipping nature of the Hasbrouck gold mineralization. To replicate the change in orientation observed within the deposit, three search-ellipse orientations were used to control the Mineral Resource Estimate. The first orientation (designated Area 1 and considered the model default code) represents the generally horizontal nature of the bedding-related low- to mid-grade mineralization within the Siebert Formation peripheral to the higher-grade, near-vertical. The second and third orientation areas (Area 2 and 3) are coded into the block model using solids and represent the more structurally-controlled mineralization that occurs along the east-dipping Siebert/Fraction Tuff contact. See Table 14-13 for the search ellipse parameters.

Table 14-13. Hasbrouck Search Ellipse Orientations

Est. Area	Major Bearing	Plunge	Tilt
1	0	0	0
2	100	0	60
3	100	0	90

Grade interpolation utilized Inverse Distance Squared (ID2), with nearest neighbor and ordinary kriging estimates also being made for checking estimation results and sensitivities. Variography and geostatistical evaluations were made to determine distances for search and classification criteria.

The estimation parameters applied at Hasbrouck are summarized in Table 14-14. The estimation used two search passes for the low-grade domains (coded domains 0 and 100), and three search passes for the mid-and high-grade mineral domains (domains coded as 200 and 300), with successive passes not overwriting previous estimation passes. The first-pass search distances take into consideration the results of both the variography and drill-hole spacing. The second- and third-pass was designed to estimate grade into all blocks coded to the mineral domains that were not estimated in the first pass. Due to the generally similar mineral orientations and statistical correlations between the gold and silver mineralization, and the relatively low value that the silver contributes to the project economics, the silver estimate uses the same estimation parameters as developed for the gold mineralization.

Table 14-14. Summary of Hasbrouck Estimation Parameters

Estimation Pass	Search Ranges (ft)			Composite Constraints		
	Major	Semi-Major	Minor	Min	Max	Max/hole
Domain 10 and 100						
1	300	300	200	2	15	3
2	500	500	500	1	18	3
Domain 200 and 300						
1 (area 1)	150	150	100	2	12	3
1 (area 2 and 3)	150	150	50	2	12	3
2	300	300	200	2	18	3
3	500	500	500	1	18	3

The estimation passes were performed independently for each of the mineral domains, so that only composites coded to a particular domain were used to estimate grade into blocks coded by that domain. The estimated grades were coupled with the partial percentages of the mineral domains to enable the calculation of a single weight-averaged block-diluted grade for each block.

14.3.10 HASBROUCK MINE MINERAL RESOURCES

Mr. Bickel classified the Hasbrouck Mine Mineral Resources to Measured, Indicated, and Inferred categories using a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology (Table 14-15). The pre-Allied drilling is limited to Indicated and Inferred Mineral Resources only due to the general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to drill-hole locations.

Table 14-15. Hasbrouck Mine Classification Parameters

Class	Estimation Pass	Min. Number of Drill holes	Min. Number of Composites	Avg. Dist. to Nearest 2 Composites
Measured	1	2*	3	50
Indicated	1	2	2	145
Inferred	all other modeled mineralization			
*minimum one Allied hole				

The Hasbrouck Mine stated Mineral Resource is fully diluted to 20ft x 20ft x 20ft blocks and tabulated on AuEq grade cut-off that was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. The block dimensions were chosen as practical sizes for open-pit mining of a deposit of this kind.

To meet the requirement of the Mineral Resources having reasonable prospects for eventual economic extraction, a pit optimization was completed using the parameters summarized in Table 14-16. The recovery applied to the optimization varies by alteration and redox domain, as per the discussion in section 13.

Table 14-16. Hasbrouck Mine Pit Optimization Cost Parameters

Parameters	Values Used	Unit
Mining Cost	2.39	$/ton mined
Processing Cost	4.81	$/ton processed
G&A Cost	0.36	$/ton processed
Upper Siebert Average Au Recoveries	Rec_{gold} = (0.0009 * (Depth below topo in feet)) + 0.3026 + 0.10	
Upper Siebert Average Ag Recoveries	24%	
Lower Siebert Average Au Recoveries	Rec_{gold} = (0.0002 * (Depth below topo in feet)) + 0.6412 + 0.05	
Lower Siebert Average Ag Recoveries	17%	
Au Price	1850	$/oz produced
Ag Price	22.75	$/oz produced
Royalty	2.38	NSR

1. Mineral Resources for Hasbrouck Mine are estimated using a gold equivalent 0.007oz AuEq/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1,850 per ounce and silver price of $22.75 per ounce , a mining cost of $2.39/ton mined, a processing cost of $4.81/ton processed, a lithologic- and depth dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.36/ton processed, and a 2.38% NSR Royalty.
2. The Effective Date of the Mineral Resource estimations is December 15, 2022.
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Measured and Indicated Mineral Resources are reported inclusive of Mineral Reserves.
5. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration.
6. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.
7. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained gold content.

The Hasbrouck Mine Mineral Resources are inclusive of Mineral Reserves and listed in Table 14-17 using a cut-off grade of 0.007oz AuEq/ton.

The formula used to calculate the AuEq grade for the Upper Siebert Formation is:

oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0053)

The formula used to calculate the AuEq grade for the Lower Siebert Formation is:

oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0027)

The AuEq grade is calculated using the individual gold and silver grades of each block, along with a gold price of $1,850.00 per ounce gold and a silver price of $22.75 per ounce silver. The AuEq grade calculation includes the difference in gold versus silver recovery in the proposed heap-leach processing scenario.

The block-diluted Mineral Resources are also tabulated at additional cut-offs in Table 14-19 in order to provide grade-distribution information, as well as to provide for economic conditions other than those envisioned by the 0.007oz AuEq/ton cut-off. Hasbrouck Mine Mineral Resources have an Effective Date of December 15, 2022.

Figure 14-9 through Figure 14-12 show cross sections of the block model that correspond to the mineral-domain cross sections in Figure 14-5 through Figure 14-8 respectively.

Table 14-17. Hasbrouck Mine Reported Mineral Resources (0.007oz AuEq/ton cut-off grade)

Hasbrouck Mine Mineral Resources					
Measured					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	6,987	0.019	0.39	134	2,752
Indicated					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	35,041	0.015	0.27	516	9,404
M&I					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	42,028	0.015	0.29	651	12,156
Inferred					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	5,161	0.011	0.19	56	986

1. Mineral Resources for Hasbrouck Mine are estimated using a gold equivalent 0.007oz AuEq/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1,850 per ounce and silver price of $22.75 per ounce , a mining cost of $2.39/ton mined, a processing cost of $4.81/ton processed, a lithologic- and depth dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.36/ton processed, and a 2.38% NSR Royalty.
2. The Hasbrouck gold equivalent cutoff grade is using the following formulas:
   - Oz AuEq/ton = oz Au/ton + (oz Ag/ton x AuEq Factor)
   - AuEq Factor = (Au Price / Ag Price) x (Au Recovery / Ag Recovery)
   - Upper Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0053)
   - Lower Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0027)
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Measured and Indicated Mineral Resources are reported inclusive of Mineral Reserves.

5. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration.
6. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
7. The Effective Date of the Mineral Resource estimations is December 15, 2022.
8. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

Table 14-18. Hasbrouck Mine Reported Mineral Resources (0.007oz AuEq/ton cut-off grade) by Formation.

Measured Mineral Resources by Lithology					
Upper Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	1,337	0.019	0.39	26	516
Lower Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	5,649	0.019	0.40	109	2,236
Tertiary Volcanics					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	0	0	0	0	0
Total					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	6,987	0.019	0.39	134	2,752
Indicated Mineral Resources by Lithology					
Upper Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	5,827	0.016	0.26	90	1,509
Lower Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	29,213	0.015	0.27	426	7,895
Tertiary Volcanics					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	1	0.008	0.13	0	0
Total					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	35,041	0.015	0.27	516	9,404

M&I Mineral Resources by Lithology					
Upper Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	7,165	0.016	0.28	116	2,025
Lower Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	34,863	0.015	0.29	535	10,131
Tertiary Volcanics					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	1	0.008	0.13	0	0
Total					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	42,028	0.015	0.29	651	12,156
Inferred Mineral Resources by Lithology					
Upper Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	578	0.010	0.10	6	60
Lower Siebert					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	4,567	0.011	0.20	50	924
Tertiary Volcanics					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	15	0.008	0.19	0	3
Total					
Material	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	5,161	0.011	0.19	56	986

1. Mineral Resources for Hasbrouck Mine are estimated using a gold equivalent 0.007oz AuEq/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1,850 per ounce and silver price of $22.75 per ounce , a mining cost of $2.39/ton mined, a processing cost of $4.81/ton processed, a lithologic- and depth dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.36/ton processed, and a 2.38% NSR Royalty.
2. The Hasbrouck gold equivalent cutoff grade is using the following formulas:
   - Oz AuEq/ton = oz Au/ton + (oz Ag/ton x AuEq Factor)
   - AuEq Factor = (Au Price / Ag Price) x (Au Recovery / Ag Recovery)
   - Upper Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0053)
   - Lower Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0027)
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Measured and Indicated Mineral Resources are reported inclusive of Mineral Reserves.
5. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is

reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration.

6. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
7. The Effective Date of the Mineral Resource estimations is December 15, 2022.
8. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

Table 14-19. Hasbrouck Mine Mineral Resources

Measured					
oz AuEq /ton Cutoff (ID)	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
0.007	*6,987*	*0.019*	*0.39*	*134*	*2,752*
0.008	6,279	0.021	0.43	129	2,683
0.009	5,600	0.022	0.46	124	2,596
0.01	4,999	0.024	0.50	119	2,491
0.011	4,531	0.025	0.53	115	2,384
0.012	4,181	0.027	0.55	111	2,293
0.013	3,895	0.028	0.57	108	2,213
0.014	3,656	0.029	0.59	105	2,140
0.015	3,469	0.030	0.60	103	2,079
0.02	2,623	0.034	0.67	89	1,763
0.03	1,051	0.051	0.97	54	1,020
0.05	350	0.087	1.49	30	521
Indicated					
oz AuEq /ton Cutoff (ID)	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
0.007	*35,041*	*0.015*	*0.27*	*516*	*9,404*
0.008	29,978	0.016	0.30	482	8,985
0.009	25,363	0.018	0.33	447	8,400
0.01	21,587	0.019	0.36	415	7,736
0.011	18,411	0.021	0.38	385	7,082
0.012	16,060	0.022	0.41	361	6,521
0.013	14,515	0.024	0.42	344	6,104
0.014	13,423	0.025	0.43	331	5,804
0.015	12,568	0.025	0.44	320	5,548
0.02	9,008	0.029	0.48	263	4,336
0.03	2,980	0.042	0.63	126	1,869
0.05	723	0.070	0.80	51	579

Inferred					
oz AuEq /ton Cutoff (ID)	K Tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
0.007	***5,161***	***0.011***	***0.19***	***56***	***986***
0.008	4,045	0.012	0.22	49	894
0.009	2,965	0.014	0.25	40	745
0.01	2,285	0.015	0.28	35	633
0.011	1,854	0.017	0.30	31	559
0.012	1,571	0.018	0.32	28	502
0.013	1,331	0.019	0.34	25	451
0.014	1,169	0.020	0.36	23	417
0.015	1,052	0.020	0.37	21	388
0.02	601	0.024	0.41	14	249
0.03	70	0.036	0.46	3	32
0.05	6	0.056	0.73	0	4

1. The project Mineral Resources are shown in bold and italics and are comprised of all model blocks at a 0.007 AuEq/ton cutoff that lie within optimized Mineral Resource pits;
2. Tabulations at higher cutoffs than used to define the Mineral Resources represent subsets of the Mineral Resources;
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability;
4. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration; and
5. Measured and Indicated Mineral Resources are reported inclusive of Mineral Reserves.
6. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.

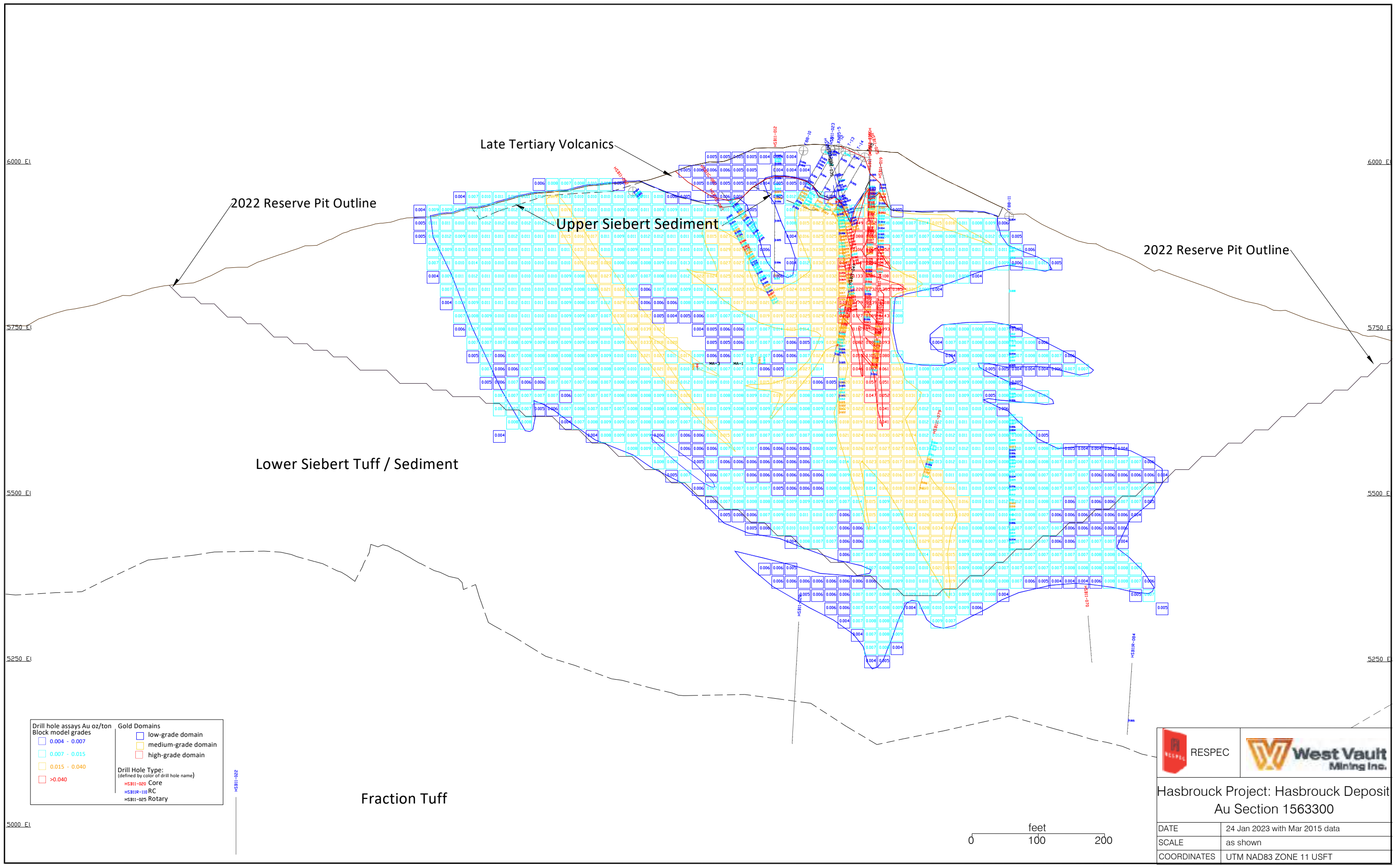

Figure 14-9. Hasbrouck Mine Section 1563300 Showing Block Model Gold Grades, Looking West

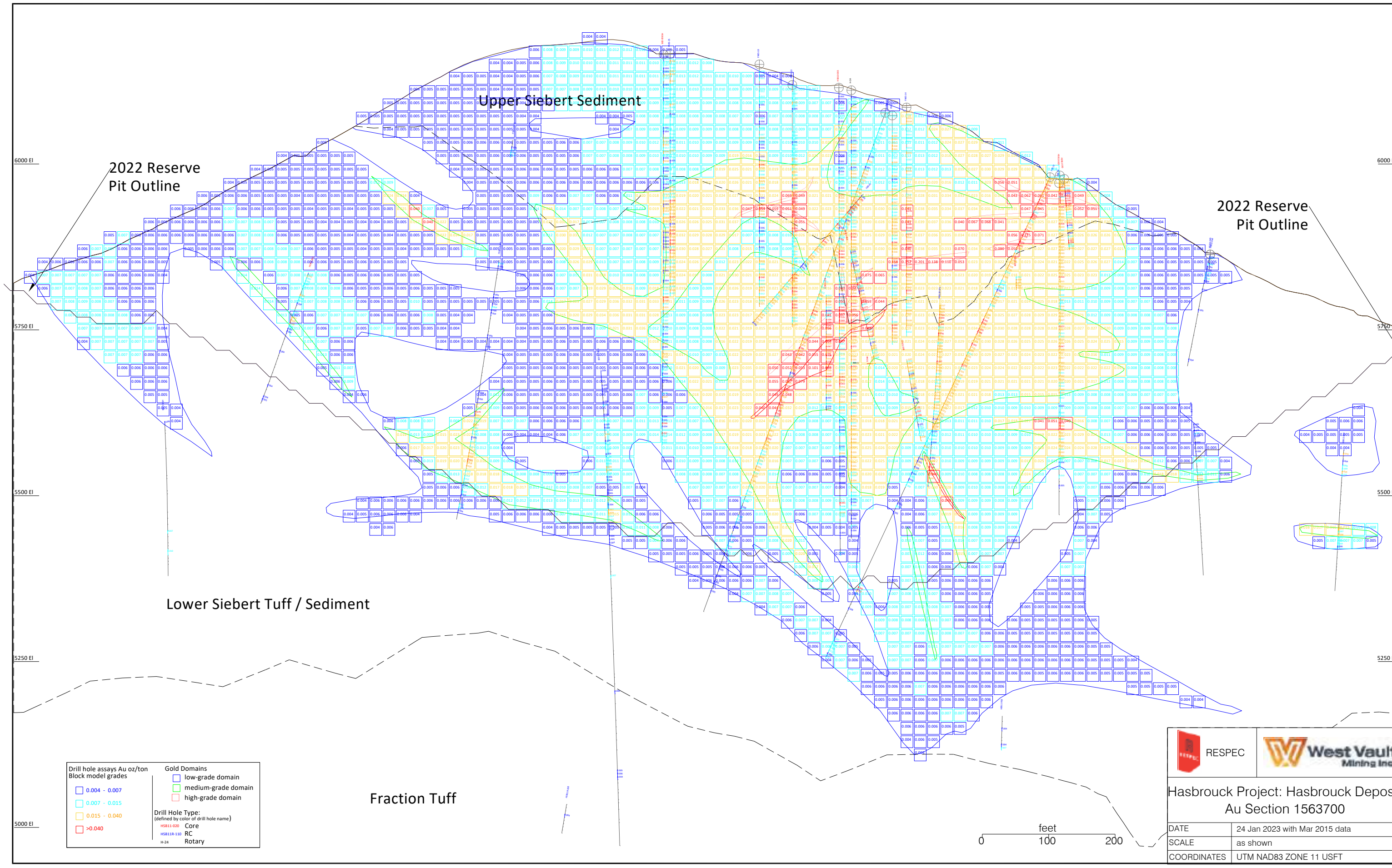

Figure 14-10 . Hasbrouck Mine Section 1563700 Showing Block Model Gold Grades, Looking West

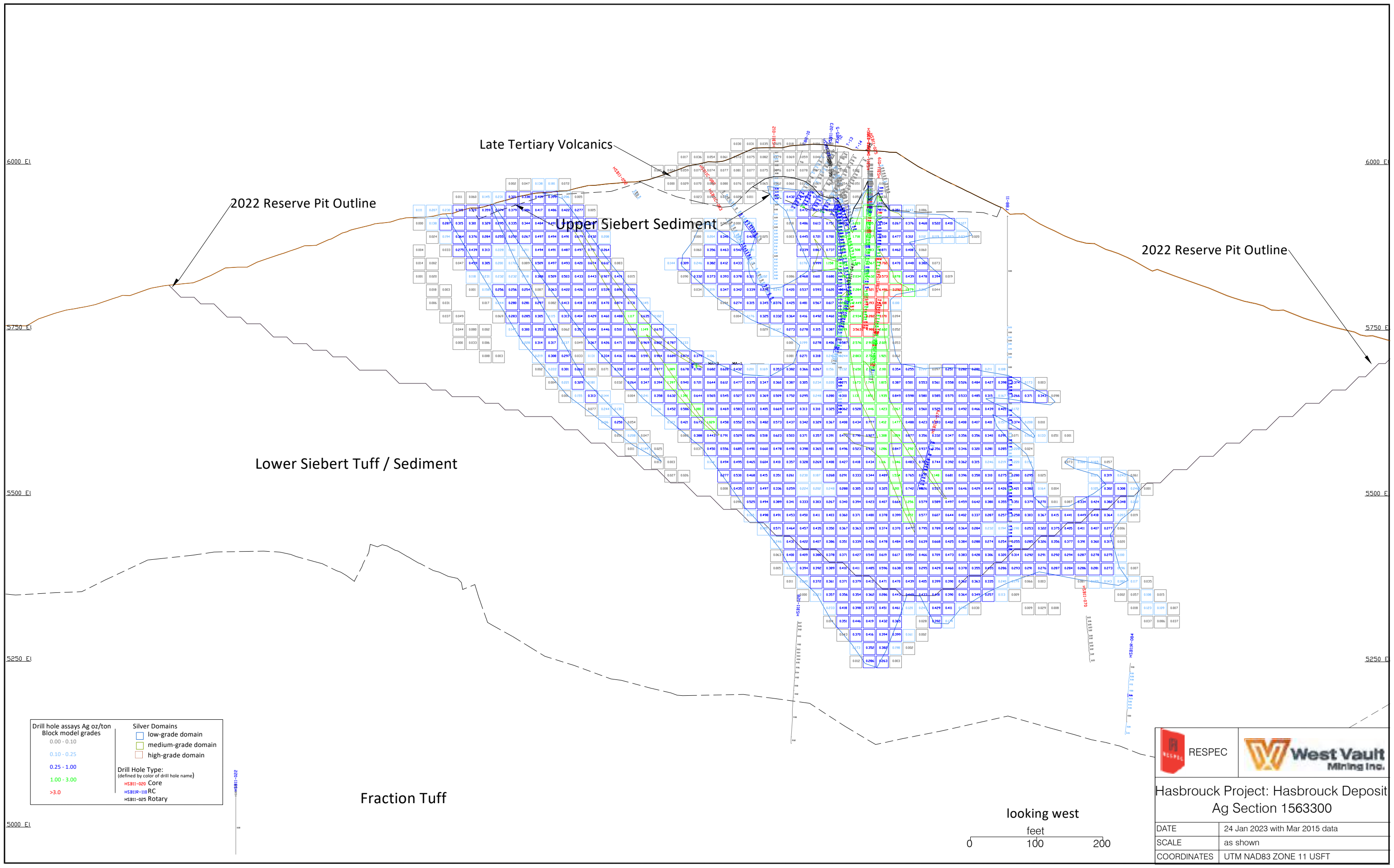

Figure 14-11. Hasbrouck Mine Section 1563700 Showing Block Model Silver Grades, Looking West

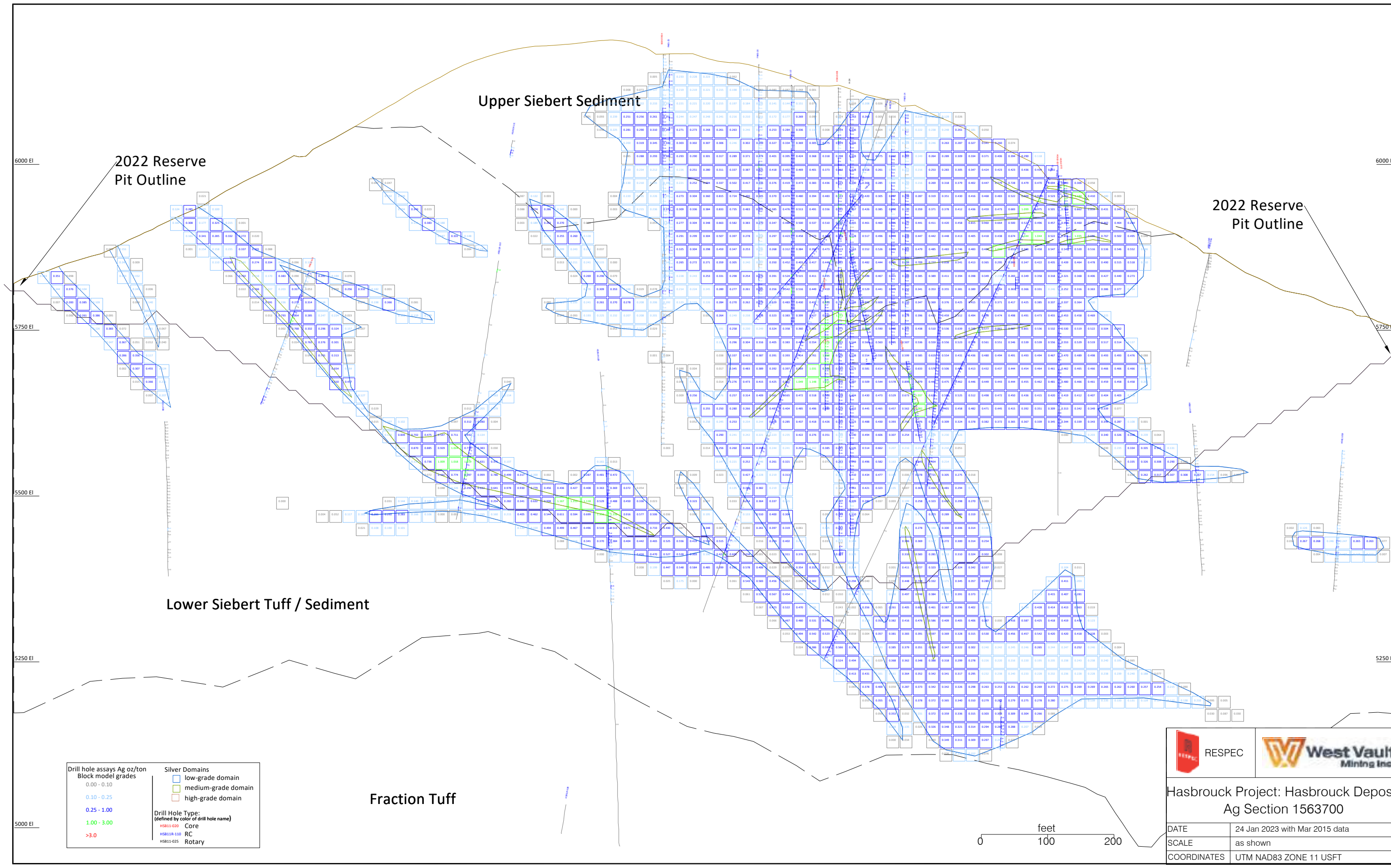

Figure 14-12. Hasbrouck Mine Section 1563700 Showing Block Model Silver Grades, Looking West

14.3.11 MODEL CHECKS

Volumes indicated by the sectional mineral-domain modeling were compared to the level-plan volumes and those coded to the block model to assure close agreement, and all block-model coding was checked visually on the computer. Nearest-neighbor and ordinary-krige estimates of the Hasbrouck Mineral Resources were undertaken as a check on the inverse-distance-squared Mineral Resource model. Grade-distribution plots of assays and composites versus the nearest-neighbor, krige, and inverse-distance block grades were also evaluated as a check on the estimation. Finally, the inverse-distance grades were visually compared to the drill-hole assay data to assure that reasonable results were obtained.

14.3.12 COMMENTS ON THE HASBROUCK MINERAL RESOURCE MODELING

The Hasbrouck gold and silver Mineral Resource is based on drill-sample analyses, density measurements, logged silicification content, and lithologic and structural geologic contacts. At a 0.007oz AuEq/ton cut-off, Hasbrouck mineralization consists of a single, irregularly shaped deposit that extends for more than 2,500ft in an east-west direction over the top of Hasbrouck Mountain. The mineralization at Hasbrouck is accompanied by strong pervasive silicification within the Upper Siebert and the top of the Lower Siebert. Within the large, continuous lower-grade mineralized shell, higher-grade gold and silver mineralization is related to dominantly near-vertical, west-northwest trending zones of sheeted silica veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccias. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent throughout the deposit, but is especially evident in many of the moderate-grade zones along the peripheries of the deposit. Structural control is present along various northwest trending sub parallel structures. Crosscutting N-S structures locally off-sets mineralization.

The core of the deposit is relatively well-defined and infill drilling is not expected to materially change the current Mineral Resource model and estimate. Additional drilling along the periphery of the deposit, including following up on the limited 2014 drill program completed by WVM on the northeast edge of the deposit, has the potential to extend the Mineral Resource to the east and west along the dominant mineral trend observed within the deposit.

RESPEC

15.0 MINERAL RESERVE ESTIMATES

15.1 INTRODUCTION

Mr. Dyer classifies Mineral Reserves in order of increasing confidence into Probable and Proven categories to be in accordance with the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2019), and therefore Canadian National Instrument 43-101. Mineral Reserves for the Hasbrouck Project were developed by applying relevant economic criteria to define the economically extractable portions of the Mineral Resource. CIM standards require that modifying factors be used to convert Mineral Resources to Reserves. The standards define modifying factors and Proven and Probable Mineral Reserves with CIM's explanatory material shown in italics as follows:

> Mineral Reserve
>
> *Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.*
>
> A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.
>
> The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.
>
> The public Disclosure of a Mineral Reserve must be demonstrated by a Pre-Feasibility Study or Feasibility Study.
>
> *Mineral Reserves are those parts of Mineral Resources which, after the application of all mining factors, result in an estimated tonnage and grade which, in the opinion of the Qualified Person(s) making the estimates, is the basis of an economically viable project after taking account of all relevant Modifying Factors. Mineral Reserves are inclusive of diluting material that will be mined in conjunction with the Mineral Reserves and delivered to the treatment plant or equivalent facility. The term 'Mineral Reserve' need not necessarily signify that extraction facilities are in place or operative or that all governmental approvals have been received. It does signify that there are reasonable expectations of such approvals.*
>
> *'Reference point' refers to the mining or process point at which the Qualified Person prepares a Mineral Reserve. For example, most metal deposits disclose Mineral Reserves with a "mill feed" reference point. In these cases, reserves are reported as mined ore delivered to the plant and do not include reductions attributed to anticipated plant losses. In contrast, coal reserves have traditionally been reported as tonnes of "clean coal". In this coal example, reserves are reported as a "saleable product" reference point and include reductions for plant yield (recovery). The Qualified Person must clearly state the 'reference point' used in the Mineral Reserve estimate.*

Probable Mineral Reserve

A Probable Mineral Reserve is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

The Qualified Person(s) may elect, to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the Modifying Factors is lower than that applied to a Proven Mineral Reserve. Probable Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study.

Proven Mineral Reserve

A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect the potential economic viability of the deposit. Proven Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study. Within the CIM Definition standards the term Proved Mineral Reserve is an equivalent term to a Proven Mineral Reserve.

Modifying Factors

Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

RESPEC has used Measured and Indicated Mineral Resources as the basis to define Mineral Reserves for both Three Hills and Hasbrouck mines, which together compose the Hasbrouck Project. Mineral Reserve definition was done by first identifying ultimate pit limits using economic parameters and pit optimization techniques. The resulting optimized pit shells were then used for guidance in pit design to allow access for equipment and personnel. RESPEC then considered mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors for defining the estimated Mineral Reserves.

Note that the Mineral Reserves stated in this updated technical report include updated costs, which have increased but have been offset by increasing metal prices. RESPEC has updated the pit optimizations and compared the results with pit designs for both Three Hills and Hasbrouck mines. The result is that the 2016 pit designs remain valid in comparison to the updated $1,750/oz Au and $21.50/oz Ag pit optimization shells. The design descriptions in the following sections are primarily unchanged from the 2016 Technical Report.

Three Hills has been designed using five pit phases to detail construction needs. The ultimate Three Hills pit design was expanded outside of the optimized pit shell to include additional Brougher Rhyolite which will be used for construction.

Hasbrouck has been designed using four pit phases. RESPEC used the phased pit designs to define the production schedule, which was then used for cash-flow analysis for the pre-feasibility study. The final cash-flow model was produced by RESPEC and demonstrates that the deposits make a positive cash flow and are reasonable with respect to statement of Mineral Reserves for the Hasbrouck Project.

15.2 PIT OPTIMIZATION

Pit optimization was done for the 2015 PFS using Geovia's Whittle (version 4.5.2) software and has not been updated for this study. The optimization used economic and geometrical parameters to define the ultimate pit for both deposits. The economic and geometrical parameters from 2015 remain relevant for this study. Pit optimization used only Measured and Indicated Mineral Resources for processing. All Inferred material was considered waste.

15.2.1 ECONOMIC PARAMETERS

Economic parameters used for the pit optimization are provided in Table 15-1. These are initial parameters used for the pre-feasibility to determine the pit design and may differ from the final values used in the cash-flow model. Pit optimizations were re-run using the final cash-flow values as a test to ensure that pit designs remained valid.

Table 15-1 Pre-Feasibility Economic Parameters

			Hasbrouck	
		Three Hills	Upper Siebert	Lower Siebert
Mining	$/ton Mined	$ 2.39	$ 2.39	$ 2.39
Leaching	$/ton Processed	$ 2.33	$ 4.81	$ 4.81
G&A Cost per Year	$/yr	$ 2,262,000	$ 2,262,000	$ 2,262,000
Tons per Day	ton/day	15,000	17,000	17,000
Days per Year	days/yr	360	360	360
Tons per Year	ton/yr	5,400,000	6,120,000	6,120,000
G&A Cost per Ton	$/ton Processed	$ 0.42	$ 0.37	$ 0.37
Recovery - Au		Eq 1	Eq 2	Eq 3
Recovery - Ag			24%	17%
Royalty	NSR	2.38%	* 3.88%	* 3.88%

- **All of Hasbrouck is Subject to a 2.38% NSR royalty and portions of Hasbrouck are subject to a 1.5% Royal Gold royalty*
- *Eq1 Recgold= min(0.925, (0.1786 *ln (grade in opt) + 1.5203) - 0.025)*
- *Eq2 Recgold= (0.0009 * (Depth below topo in feet)) + 0.3026 + 0.10*
- *Eq3 Recgold= (0.0002 * (Depth below topo in feet)) + 0.6412 + 0.05*
- *CIM definitions were followed for Mineral Reserves.*
- *Inferred Mineral Resource do not contribute to the financial performance of the Project and is treated in the same way as waste.*
- *There are no known mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the estimate.*
- *Mineral Reserves are included in the Measured and Indicated Mineral Resource.*

Mining costs are based on budgetary quotations from mining contractors and include owner's costs for engineering, geology, and contract management. Processing costs were provided by KCA. Three Hills process costs anticipates ROM leaching only while Hasbrouck anticipates use of HPGR tertiary crushing.

Yearly G&A have been estimated by RESPEC with input from WVM and are discussed later. The yearly G&A costs have been divided by the average annual tonnage to determine the cost per ton.

The royalty has been applied as a gross smelter return ("GSR"), which means that the royalty percentage has been multiplied by the recovered metal and metal prices. This is conservative as the royalty will have deductions for metal transportation, insurance, and refining costs.

Gold and silver recovery estimates were provided by Mark Jorgensen, the Qualified Person responsible for Section 13.0. The recovery for Three Hills was provided as a grade dependent equation as shown in Equation 15-1. Three Hills does not have any silver Mineral Resources defined, so there is not a recovery for Three Hills silver.

Equation 15-1 Three Hills Grade Dependent Recovery

$$Rec_{Au} = min(0.925, (0.1786 * ln(Grade_{Au}) + 1.5203) - 0.025)$$

Where: *Rec_{Au}* is in a decimal fraction
$Grade_{Au}$ is in oz Au/ton

The recovery of gold and silver to be used for the Hasbrouck Mine was also provided by Mr. Jorgensen. Gold recovery was determined to be associated to both lithology and depth below the surface. The lithology was broken into either Upper or Lower Siebert and a depth dependent recovery was calculated for each based on Equation 15-2 and Equation 15-3. The depth below the surface was determined by placing a grid of points at the surface and then measuring downward from those point to the centroid of the block in question, and storing that value in the Mineral Resource model.

Equation 15-2 Gold Recovery for Upper Siebert Material

$$Rec_{gold} = \left(0.0009 * (Depth)\right) + 0.3026 + 0.10$$

Equation 15-3 Gold Recovery for Lower Siebert Material

$$Rec_{gold} = \left(0.0002 * (Depth)\right) + 0.6412 + 0.05$$

Where: *Rec_{Au}* is in a decimal fraction
Depth is the depth below the surface in feet

15.2.2 GEOMETRICAL PARAMETERS

The only geometrical parameters applied to Three Hills and Hasbrouck pit optimizations are slope parameters. Slopes have been based on a geotechnical study from Golder Associates Inc. (Golder, 2015). The study was completed as part of the pre-feasibility and includes recommendations for both Three Hills and Hasbrouck mines. These recommendations are documented in the Golder Associates report: "*Hasbrouck Project, Esmeralda County, Nevada Pre-Feasibility Level Pit Slope Evaluation*" (January 2015). The geotechnical report was further reviewed by SRK Consulting and documented in a memorandum "*Hasbrouck Project Geotech PFS Review*" (Wellman, 2015). In summary, SRK Consulting concluded that "*The methodology and approach presented in the report by Golder Associates is valid and in accordance with industry accepted best practices. It* *is SRK's opinion that the slope angle recommendations provided by Golder are appropriate at a pre-feasibility study (PFS) level*'.

15.2.2.1 THREE HILLS MINE SLOPE PARAMETERS

Slope parameters were based on studies provided by Golder Associates. Three Hills slope recommendations were provided based on rock type and maximum slope heights. RESPEC flagged a zone type into the block model based on the rock types. The Three Hills recommended inter-ramp slopes are shown by zone in Table 15-2, as provided by Golder Associates. RESPEC flattened the slopes used for the pit optimization to represent the overall angle that reflects the inclusion of ramps in the final pit designs as shown in Table 15-2.

Table 15-2 Three Hills Slope Parameters

	Zone Number	Inter-Ramp Angle (degrees)	Maximum Slope Height	Overall Angle Used
North Siebert	1	35	120	25 to 35
South Siebert	2	40	200	38
Fraction Tuff	3	45	200	45
Brougher Dacite Flow	4	45	200	45
Oddie Ryholite	5	45	200	45

15.2.2.2 HASBROUCK MINE SLOPE PARAMETERS

The mining at Hasbrouck will be predominately in the Siebert Formation. For the Siebert Formation, Golder provided slope recommendations based on the overall slope height. In addition, it was recommended that a 65ft geotechnical bench (or the addition of a ramp) be added to the design every 120ft in wall height. Table 15-3 shows the recommended slopes by wall height.

Table 15-3 Hasbrouck Mine Slope Recommendations

Overall Slope Heights (ft)	Inter-Ramp Angle (degrees)	Maximum Height w/out Geotech Bench (ft)
<=360	40	120
360 to 480	35	120
480 to 600	32	120
600 to 720	30	120
720 to 840	28	120

Because the deposit is located under the top of Hasbrouck Mountain, the wall heights in different directions will be variable for both the ultimate pit and any pit phases that are designed. For pit optimizations, the modeling area was divided into 9 different zones around the potential pit so that slopes could be provided in a variable manner. The optimization required some trial and error to apply the slopes appropriately based on how far down the edge of the hill each pit would be mined. The final pit optimizations included some flattening to account for ramps and required geotechnical benches.

15.2.3 CUT-OFF GRADES

15.2.3.1 THREE HILLS CUT-OFF GRADE

Internal and external cut-off grades were calculated for Three Hills Mine based on the economic parameters. Internal cut-off grades assume that an economical pit design has been developed, and because all the material inside of the pit will be mined, regardless of waste/ore classification, the mining cost inside the pit is a sunk cost. Thus, the internal cut-off grade does not include mining cost. In contrast, the external cut-off grade includes the mining cost and is a break-even cut-off grade.

The calculated internal cut-off grades for Three Hills are shown in Table 15-4. These are shown by gold price to illustrate how the gold price can impact the cut-off grade. However, the resulting cut-off grades are very low in relation to the minimum detection limits when assaying for gold. As such, a minimum cut-off grade has been applied for each deposit. For pit optimization and Mineral Reserve reporting, a minimum cut-off grade of 0.005 oz Au/ton has been applied to Three Hills Mine.

Table 15-4 Three Hills Cut-off Grades (oz Au/ton)

Au Price ($/oz Au)	Recovery Assumed	Three Hills Internal
$1,200	57.4%	0.005
$1,300	56.3%	0.005
$1,400	55.3%	0.004
$1,500	54.4%	0.004
$1,600	53.5%	0.004
$1,700	52.7%	0.004
$1,750	52.3%	0.004
$1,800	52.0%	0.004
$1,900	51.2%	0.004
$2,000	50.6%	0.003

15.2.3.2 HASBROUCK MINE CUT-OFF GRADE

Because the recovery equations used for Hasbrouck create a variable recovery compared to the constant recovery of silver, the application of a grade equivalent cutoff grade was deemed inappropriate. Thus, RESPEC created a GMV for each block. This value was calculated based on the metal prices, the block recovery, grade of the block, and the royalty applied to the block. The GMV was calculated based on Equation 15-4, Equation 15-4, and Equation 15-4.

Equation 15-4 GMV_{Au} Calculation

$$GMV_{Au} = Rec_{Au} * Grade_{Au} * (Price_{Au} - Sell_{Au}) * (1 - Roy)$$

Equation 15-5 GMV_{Ag} Calculation

$$GMV_{Ag} = Rec_{Ag} * Grade_{Ag} * \left(Price_{Ag} - Sell_{Ag}\right) * (1 - Roy)$$

Equation 15-6 GMV_{Tot} Calculation

$$GMV_{Tot} = GMV_{Au} + GMV_{Ag}$$

Where: GMV_{Au} is the Gross Metal Value of gold for the block.

GMV_{Ag} is the Gross Metal Value of silver for the block.

GMV_{Tot} is the Total Gross Metal Value of the block.

Rec_{Au} is the recovery of gold

Rec_{Ag} is the recovery of silver

$Grade_{Au}$ is the gold grade in oz Au/ton

$Grade_{Ag}$ is the gold grade in oz Ag/ton

$Price_{Au}$ is the gold price in $/oz Au

$Price_{Ag}$ is the gold price in $/oz Ag

$Sell_{Au}$ is the selling cost in $/oz Au

$Sell_{Ag}$ is the selling cost in $/oz Ag

Roy is the royalty in % NSR

The cut-off grade applied to the GMV was the addition of the processing cost and the G&A costs as shown in Table 15-1 and is an internal cut-off grade as the mining cost is excluded. The internal cut-off grade applied is $5.17/ton.

15.2.4 PIT-OPTIMIZATION METHOD AND RESULTS

Whittle pit optimization was run to confirm that the 2015 pit designs were appropriate for the reporting of Mineral Reserves. The optimization of ultimate pits and pit phases were done as a two-step process.

Pit shells were first optimized using a set of pit shells based on varying revenue factors. This was done in Whittle this using a Lerchs-Grossman ("LG") algorithm. The revenue factor was multiplied by the recovered ounces and the metal prices, essentially creating a nested set of pit shells based on different metal prices. For both Three Hills Mine and Hasbrouck Mine, the revenue factors varied from 0.30 to 2.0 in increments of 0.020. A base price of $1,000 per ounce of gold was used so the resulting pit shells represent gold prices from $300 to $2,500 per ounce in increments of $25.00. This has the potential of generating up to 89 different pit shells that can be used for analysis, though in some cases pit shells with increments are coincidental to other pits and reported as a single pit. For Hasbrouck, a base price of $1000/$1750 * $21.50 or approximately $12.29 per ounce of silver was used. This results in the constant silver price ratio of $21.50: $1750.

The second step of the process was to use the Pit by Pit ("PbP") analysis tool in Whittle to generate a discounted operating cash flow (note that capital is not included). This used a rough scheduling by pit phase for each pit shell to generate the discounted value for the pit. The program develops three different discounted values: best, worst, and specified. The best-case value uses each of the pit shells as pit phases or pushbacks. For example, when evaluating pit 20, there would be 19 pushbacks mined prior to pit 20, and the resulting schedule takes advantage of mining more valuable material up front to improve the discounted value. Evaluating pit 21 would have 20 pushbacks; pit 22 would have 21 pushbacks and so on. Note that this is not a realistic case as the incremental pushbacks would not have enough mining width between them to be able to mine appropriately, but Whitle PbP analysis does help to define the maximum potential discounted operating cash flow.

The worst case does not use any pushbacks in determining the discounted value for each of the pit shells. Thus, each pit shell is evaluated as if mining a single pit from top to bottom. The worst case Whittle PbP does not have the advantage of mining more valuable material up front, so this method generally provides a lower discounted value than that of the best case.

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The specified case allows the user to specify pit shells to be used as pushbacks and then schedules the pushbacks and calculates the discounted cash flow. This is more realistic than the base case as it allows for more mining width, though the final pit design will have to ensure that appropriate mining width is available. The specified case has been used for each mine to determine the ultimate pit limits to design to, as well as to specify guidelines for designing pit phases.

The Whittle PbP runs were created using prices of $1,750 and $21.50 per ounce of gold and silver respectively. The potential ultimate pit was selected on Whittle discounted evaluations of the various pit shells using a 5% discount rate and a processing limit of 5,400,000 tons per year for Three Hills and 6,120,000 tons per year for Hasbrouck. The resulting best specified cases were compared to the 2015 pit designs and it was determined that the 2015 pit designs were reasonable for use in stating Mineral Reserves.

Of note, the final gold price used for the Hasbrouck Project cash flow was $1,790 per ounce Au and $17.50 per ounce Ag. This change in prices had a minimal impact on the results (less than 2 % on tonnage) and RESPEC believes that the pit designs resulting from the initial analysis are well within reason.

15.2.4.1 THREE HILLS MINE PIT OPTIMIZATION RESULTS

Three Hills Mine pit optimizations were completed using Whittle software with the parameters previously discussed. The basic LG results are shown in Table 15-5 by gold price in $100 per ounce increments plus the highlighted $1,750 per ounce gold price, which is the base price used for the Whittle analysis. The PbP analysis results are listed in Table 15-6 showing results for Pits 37 through 69 with Pit 54 highlighted as the best specified pit case. The PbP results are shown graphically in Figure 15-1.

Table 15-5. Three Hills Pit Optimization Results

	Material Processed			Waste	Total	Strip
Pit	K Tons	Oz Au/ton	K Ozs Au	K Tons	K Tons	Ratio
1	774	0.032	25	566	1,339	0.73
5	2,686	0.029	78	2,325	5,012	0.87
9	4,726	0.025	118	3,810	8,535	0.81
13	5,486	0.024	130	4,175	9,661	0.76
17	6,240	0.022	140	4,429	10,669	0.71
21	7,027	0.021	149	4,530	11,557	0.64
25	7,642	0.021	160	6,107	13,748	0.80
29	8,470	0.020	166	5,663	14,133	0.67
33	8,627	0.020	168	6,088	14,715	0.71
37	8,707	0.019	169	6,149	14,857	0.71
41	9,437	0.018	174	6,122	15,559	0.65
45	9,528	0.018	175	6,194	15,722	0.65
49	9,639	0.018	176	6,315	15,954	0.66
53	9,702	0.018	177	6,580	16,282	0.68
57	9,873	0.018	179	6,968	16,841	0.71
59	9,907	0.018	179	7,039	16,946	0.71
61	9,950	0.018	179	7,123	17,073	0.72
65	10,020	0.018	180	7,340	17,360	0.73
69	10,147	0.018	181	7,875	18,022	0.78
73	10,236	0.018	182	8,181	18,416	0.80
77	10,268	0.018	183	8,340	18,608	0.81
80	10,283	0.018	183	8,368	18,651	0.81
84	10,360	0.018	184	8,896	19,255	0.86

Table 15-6 Three Hills Pit by Pit Analysis Results

Pit	Material Processed			Waste	Total	Strip	Disc. Op Cash Flow (M USD)			LOM
	K Tons	Oz Au/ton	K Ozs Au	K Tons	K Tons	Ratio	Best	Specified	Worst	Years
37	9,256	0.019	172	5,601	14,857	0.61	$ 166.63	$ 165.73	$ 164.96	1.71
38	9,348	0.019	173	5,948	15,295	0.64	$ 167.14	$ 166.21	$ 165.41	1.73
39	9,370	0.019	174	6,021	15,391	0.64	$ 167.24	$ 166.31	$ 165.50	1.74
40	9,410	0.019	174	6,060	15,470	0.64	$ 167.34	$ 166.40	$ 165.58	1.74
41	9,437	0.018	174	6,122	15,559	0.65	$ 167.43	$ 166.49	$ 165.66	1.75
42	9,441	0.018	174	6,132	15,573	0.65	$ 167.44	$ 166.50	$ 165.67	1.75
43	9,499	0.018	175	6,146	15,644	0.65	$ 167.52	$ 166.56	$ 165.72	1.76
44	9,518	0.018	175	6,177	15,695	0.65	$ 167.56	$ 166.60	$ 165.75	1.76
45	9,528	0.018	175	6,194	15,722	0.65	$ 167.58	$ 166.61	$ 165.76	1.76
46	9,581	0.018	176	6,258	15,839	0.65	$ 167.65	$ 166.68	$ 165.81	1.77
47	9,589	0.018	176	6,262	15,851	0.65	$ 167.66	$ 166.68	$ 165.82	1.78
48	9,631	0.018	176	6,315	15,945	0.66	$ 167.71	$ 166.72	$ 165.84	1.78
49	9,639	0.018	176	6,315	15,954	0.66	$ 167.71	$ 166.72	$ 165.84	1.78
50	9,645	0.018	176	6,316	15,962	0.65	$ 167.72	$ 166.72	$ 165.84	1.79
51	9,674	0.018	177	6,449	16,124	0.67	$ 167.76	$ 166.76	$ 165.87	1.79
52	9,675	0.018	177	6,450	16,125	0.67	$ 167.76	$ 166.76	$ 165.87	1.79
53	9,702	0.018	177	6,580	16,282	0.68	$ 167.79	$ 166.79	$ 165.88	1.80
54	9,721	0.018	177	6,618	16,339	0.68	$ 167.80	$ 166.79	$ 165.88	1.80
55	9,765	0.018	177	6,625	16,390	0.68	$ 167.80	$ 166.78	$ 165.85	1.81
56	9,838	0.018	178	6,913	16,752	0.70	$ 167.81	$ 166.77	$ 165.82	1.82
57	9,873	0.018	179	6,968	16,841	0.71	$ 167.81	$ 166.76	$ 165.80	1.83
58	9,893	0.018	179	6,998	16,891	0.71	$ 167.80	$ 166.75	$ 165.79	1.83
59	9,907	0.018	179	7,039	16,946	0.71	$ 167.80	$ 166.74	$ 165.77	1.83
60	9,913	0.018	179	7,046	16,959	0.71	$ 167.79	$ 166.74	$ 165.77	1.84
61	9,950	0.018	179	7,123	17,073	0.72	$ 167.77	$ 166.70	$ 165.72	1.84
62	9,967	0.018	179	7,130	17,097	0.72	$ 167.76	$ 166.69	$ 165.71	1.85
63	9,980	0.018	180	7,154	17,134	0.72	$ 167.74	$ 166.67	$ 165.69	1.85
64	10,013	0.018	180	7,308	17,321	0.73	$ 167.70	$ 166.62	$ 165.62	1.85
65	10,020	0.018	180	7,340	17,360	0.73	$ 167.69	$ 166.61	$ 165.61	1.86
66	10,031	0.018	180	7,343	17,374	0.73	$ 167.68	$ 166.60	$ 165.59	1.86
67	10,083	0.018	181	7,753	17,836	0.77	$ 167.54	$ 166.45	$ 165.42	1.87
68	10,142	0.018	181	7,862	18,004	0.78	$ 167.46	$ 166.35	$ 165.31	1.88
69	10,147	0.018	181	7,875	18,022	0.78	$ 167.45	$ 166.34	$ 165.30	1.88

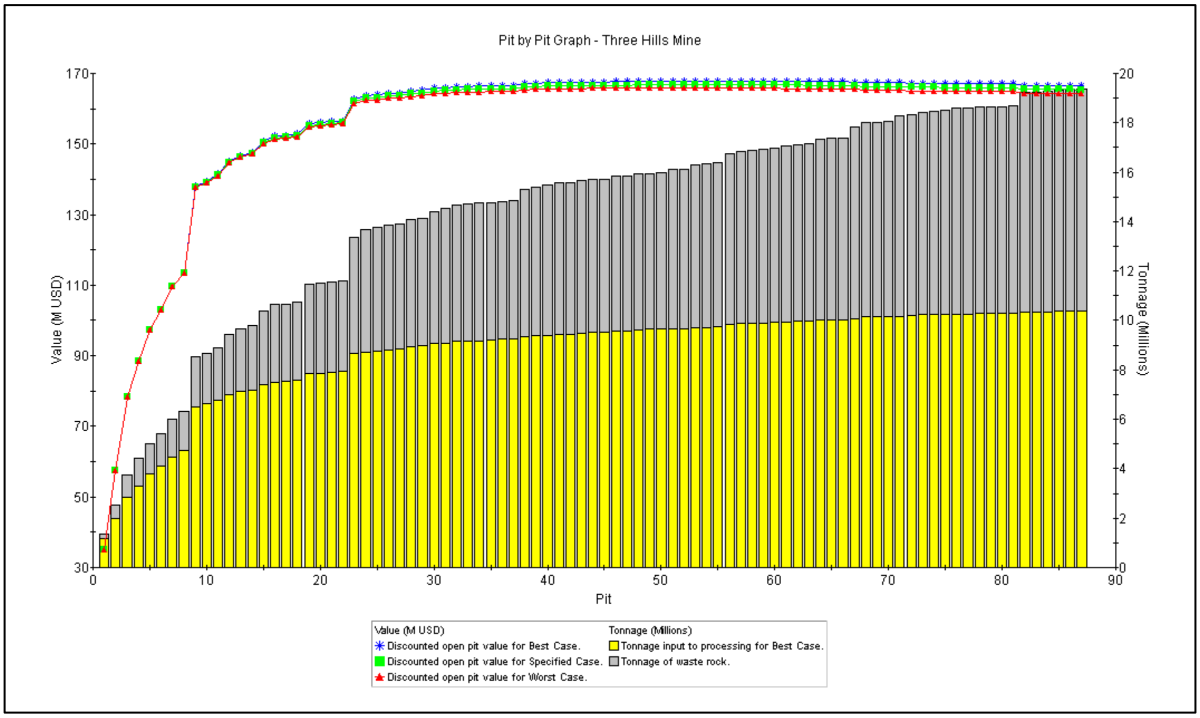

Figure 15-1. Three Hills PbP Graph

15.2.4.2 THREE HILLS PIT SHELL SELECTED FOR DESIGN COMPARISON

The PbP results shown in Table 15-6 provide the basis for determining the whittle ultimate pit limits. The best discounted value for the specified case was obtained with Pit shell 54, and this was used to compare with the 2015 pit designs. Comparing the updated Mineral Reserves to the pit optimizations, the total Mineral Reserve tonnage and gold ounces is within 1% of the tabulated Whittle tons and gold ounces.

15.2.4.3 HASBROUCK MINE PIT OPTIMIZATION RESULTS

Hasbrouck Mine pit optimizations were completed using Whittle software with the parameters previously discussed. The basic LG results are shown in Table 15-7 by gold price in $100 per ounce increments along with the $1,750 Pit shell 54 highlighted in the table. The PbP analysis results are shown in Table 15-8 and graphically in Figure 15-2

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Table 15-7. Hasbrouck Mine Pit Optimization Results

Pit	Ag Price	Material Processed					Waste	Total	Strip
		K Tons	Oz Au/ton	K Ozs Au	Oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio
4	$ 6.14	553	0.028	16	0.49	272	264	817	0.48
8	$ 7.37	767	0.027	21	0.49	377	422	1,189	0.55
12	$ 8.60	9,411	0.026	246	0.47	4,453	14,261	23,672	1.52
16	$ 9.83	13,524	0.023	316	0.43	5,812	17,474	30,998	1.29
20	$ 11.06	17,238	0.021	368	0.40	6,813	19,462	36,700	1.13
24	$ 12.29	22,205	0.019	429	0.37	8,123	22,109	44,314	1.00
32	$ 14.74	31,979	0.017	552	0.31	9,999	35,217	67,196	1.10
36	$ 15.97	33,878	0.017	574	0.31	10,370	37,470	71,348	1.11
40	$ 17.20	35,025	0.017	585	0.30	10,589	38,750	73,776	1.11
44	$ 18.43	36,649	0.016	603	0.30	10,887	41,520	78,169	1.13
48	$ 19.66	37,337	0.016	610	0.29	10,977	42,712	80,049	1.14
52	$ 20.89	37,865	0.016	615	0.29	11,055	43,634	81,499	1.15
54	$ 21.50	38,016	0.016	616	0.29	11,079	43,847	81,863	1.15
56	$ 22.11	38,273	0.016	619	0.29	11,115	44,298	82,570	1.16
60	$ 23.34	38,583	0.016	622	0.29	11,170	45,205	83,788	1.17
64	$ 24.57	38,837	0.016	624	0.29	11,223	46,098	84,935	1.19
68	$ 25.80	39,995	0.016	636	0.29	11,550	50,615	90,610	1.27
72	$ 27.03	40,247	0.016	639	0.29	11,611	51,660	91,907	1.28
76	$ 28.26	40,396	0.016	640	0.29	11,647	52,295	92,691	1.29
80	$ 29.49	40,483	0.016	641	0.29	11,672	52,714	93,197	1.30
84	$ 30.71	40,645	0.016	643	0.29	11,701	53,523	94,168	1.32

Table 15-8 Hasbrouck Mine Pit by Pit Analysis Results

Pit	Material Processed					Waste	Total	Strip	Disc. Op Cash Flow (M USD)			LOM
	K Tons	Oz Au/ton	K Ozs Au	Oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio	Best	Specified	Woarst	Years
37	34,809	0.017	581	0.30	10,429	37,005	71,814	1.06	$ 337.64	$ 335.80	$ 325.36	5.53
38	35,083	0.017	585	0.30	10,510	37,654	72,737	1.07	$ 338.41	$ 336.50	$ 325.91	5.57
39	35,263	0.017	586	0.30	10,559	37,925	73,188	1.08	$ 338.82	$ 336.87	$ 326.25	5.60
40	35,470	0.017	589	0.30	10,601	38,306	73,776	1.08	$ 339.26	$ 337.28	$ 326.61	5.63
41	35,758	0.017	592	0.30	10,657	38,934	74,691	1.09	$ 339.86	$ 337.82	$ 327.08	5.68
42	36,394	0.016	599	0.30	10,771	40,122	76,515	1.10	$ 340.93	$ 338.70	$ 327.42	5.78
43	36,434	0.016	599	0.30	10,777	40,170	76,604	1.10	$ 340.98	$ 338.74	$ 327.43	5.78
44	36,935	0.016	605	0.29	10,892	41,234	78,169	1.12	$ 341.71	$ 339.34	$ 327.75	5.86
45	37,013	0.016	606	0.29	10,901	41,387	78,400	1.12	$ 341.80	$ 339.41	$ 327.79	5.88
46	37,243	0.016	609	0.29	10,945	42,145	79,389	1.13	$ 342.10	$ 339.62	$ 327.82	5.91
47	37,326	0.016	609	0.29	10,962	42,293	79,619	1.13	$ 342.17	$ 339.66	$ 327.82	5.92
48	37,466	0.016	611	0.29	10,979	42,583	80,049	1.14	$ 342.27	$ 339.72	$ 327.83	5.95
49	37,508	0.016	611	0.29	10,982	42,621	80,129	1.14	$ 342.28	$ 339.72	$ 327.83	5.95
50	37,574	0.016	612	0.29	10,999	42,784	80,358	1.14	$ 342.32	$ 339.73	$ 327.80	5.96
51	37,717	0.016	613	0.29	11,023	43,148	80,865	1.14	$ 342.36	$ 339.72	$ 327.68	5.99
52	37,920	0.016	615	0.29	11,055	43,579	81,499	1.15	$ 342.41	$ 339.76	$ 327.63	6.02
53	37,997	0.016	616	0.29	11,076	43,798	81,795	1.15	$ 342.43	$ 339.78	$ 327.61	6.03
54	38,016	0.016	616	0.29	11,079	43,847	81,863	1.15	$ 342.43	$ 339.78	$ 327.61	6.03
55	38,095	0.016	617	0.29	11,097	44,075	82,170	1.16	$ 342.42	$ 339.77	$ 327.53	6.05
56	38,229	0.016	618	0.29	11,115	44,341	82,570	1.16	$ 342.40	$ 339.75	$ 327.40	6.07
57	38,330	0.016	619	0.29	11,135	44,624	82,954	1.16	$ 342.36	$ 339.71	$ 327.27	6.08
58	38,364	0.016	620	0.29	11,140	44,683	83,047	1.16	$ 342.35	$ 339.70	$ 327.25	6.09
59	38,442	0.016	621	0.29	11,156	45,058	83,500	1.17	$ 342.28	$ 339.63	$ 327.08	6.10
60	38,527	0.016	621	0.29	11,169	45,261	83,788	1.17	$ 342.22	$ 339.57	$ 326.95	6.12
61	38,558	0.016	622	0.29	11,171	45,322	83,879	1.18	$ 342.20	$ 339.54	$ 326.91	6.12
62	38,661	0.016	623	0.29	11,202	45,775	84,436	1.18	$ 342.06	$ 339.40	$ 326.63	6.14
63	38,732	0.016	624	0.29	11,213	46,020	84,752	1.19	$ 341.97	$ 339.31	$ 326.45	6.15
64	38,781	0.016	624	0.29	11,223	46,154	84,935	1.19	$ 341.91	$ 339.25	$ 326.37	6.16
65	38,916	0.016	625	0.29	11,250	46,592	85,508	1.20	$ 341.71	$ 339.05	$ 326.08	6.18
66	39,741	0.016	634	0.29	11,501	49,992	89,733	1.26	$ 340.26	$ 337.56	$ 323.85	6.31
67	39,903	0.016	635	0.29	11,540	50,544	90,447	1.27	$ 339.99	$ 337.29	$ 323.51	6.33
68	39,939	0.016	636	0.29	11,550	50,671	90,610	1.27	$ 339.92	$ 337.22	$ 323.43	6.34
69	39,995	0.016	636	0.29	11,557	50,888	90,883	1.27	$ 339.80	$ 337.10	$ 323.28	6.35

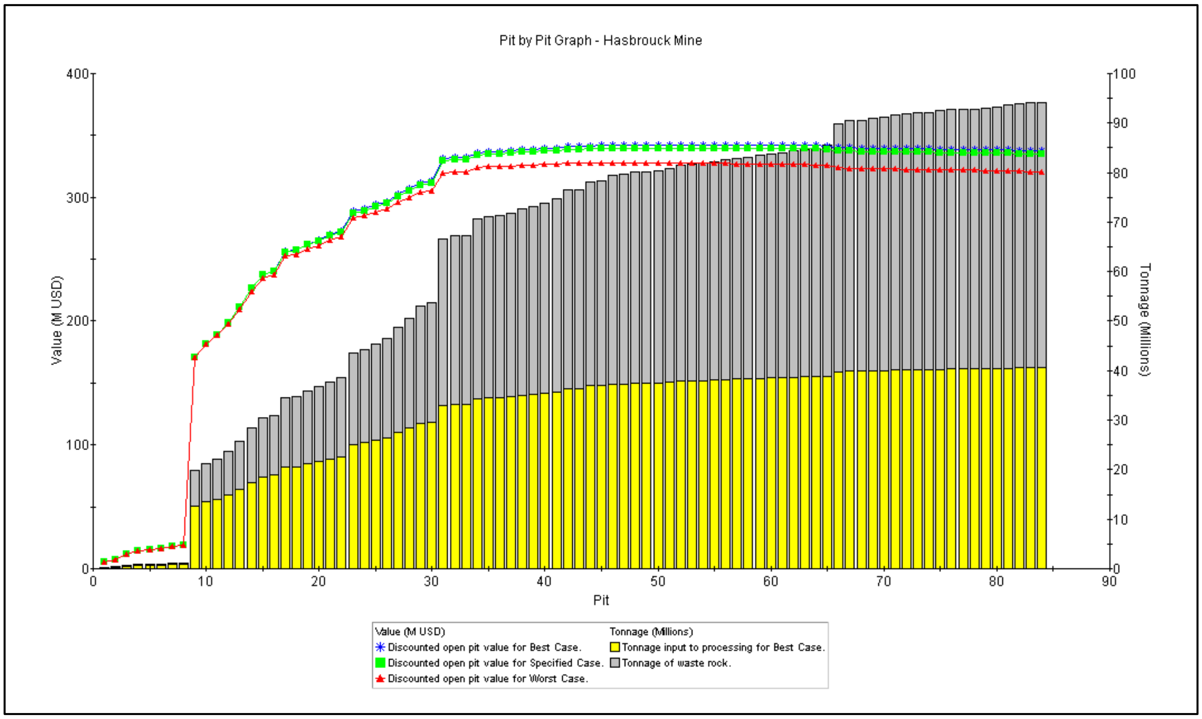

Figure 15-2. Hasbrouck Mine PbP Graph

15.2.4.4 HASBROUCK MINE PIT SHELLS SELECTED FOR DESIGN COMPARISON

The PbP results shown in Table 15-9 provide the basis for determining the ultimate pit limits for the Hasbrouck Mine. The best discounted value for the specified case was obtained with Pit shell 54, and this was used for comparison with the 2015 pit designs. Comparing the 2015 updated Mineral Reserves with Pit shell 54 Whittle results, the designs are within 10% of total pit tonnages and Mineral Reserves are 7% less than the Whittle Mineral Reserve tonnages and 5% less in terms of contained gold. Thus, while the pits to define the Mineral Reserves could be made a touch larger, this shows that the stated Mineral Reserves are reasonable with respect to the pit optimization results.

15.3 PIT DESIGNS

Detailed pit designs were completed for both the Three Hills and Hasbrouck mines. Three Hills pit designs were completed using a total of 5 pit phases so that the sequence of mining would include waste tonnages for construction purposes. Hasbrouck pit designs were completed in 4 pit phases. All pit designs were completed in Surpac 6.4.1 software using similar design parameters.

15.3.1 BENCH HEIGHT

Pit designs were created to use 20 ft bench heights. This corresponds to the Mineral Resource model block heights, and RESPEC believes this to be reasonable with respect to dilution and equipment anticipated to be used in mining.

15.3.2 PIT DESIGN SLOPES

Slope parameters were based on geotechnical studies provided by Golder Associates as previously discussed in sections 15.2.2.1 and 15.2.2.2.

15.3.2.1 THREE HILLS PIT SLOPE DESIGN PARAMETERS

Three Hills pit design has been completed to contain toes, crests, and ramp strings. The ultimate pit design was completed using 20 ft bench heights. Slope parameters used are based on the recommendations of Golder (2015). Table 15-9 shows the parameters used for the Three Hills ultimate pit design.

Table 15-9 Three Hills Slope Design Parameters

	Catch Bench Separation (ft)	Bench Face Angle (degrees)	Catch Bench Width (ft)	Inter-Ramp Angle (degrees)	Max Height w/out Ramp or 65ft. Geotech Bench (ft)
North Siebert	40	60	35	35	120
South Siebert	40	60	25	40	200
Fraction Tuff	40	70	25	45	200
Brougher Dacite Flow	40	70	25	45	200
Oddie Ryholite	40	70	25	45	200

15.3.2.2 HASBROUCK PIT SLOPE DESIGN PARAMETERS

Hasbrouck Mine pit designs have been completed with toes, crest, and ramp access. The design was completed using 4 different pit phases to promote mining of higher value material as early as possible in the schedule. The slope recommendations were provided by Golder (2015). Table 15-10 shows the parameters used for the Hasbrouck pit designs based on wall height. The parameters were applied to all pit phases individually.

Table 15-10 Hasbrouck Pit Design Parameters

Overall Slope Height (ft)	No. of Geotech Catch Benches	Catch Bench Separation (ft)	Bench Face Angle (degrees)	Catch Bench Width (ft)	Inter-Ramp Angle (degrees)	Max Height w/out Ramp or 65ft. Geotech Bench (ft)
<=360	2	40	60	25	40	120
360 to 480	3	40	60	34	35	120
480 to 600	4	40	60	41	32	120
600 to 720	5	40	60	46	30	120
720 to 840	6	40	60	52	28	120

15.3.3 HAUL ROADS

Haul roads and ramps were designed for both mines to have a maximum centerline gradient of 10%. In areas where the ramps may curve along the outside of the pit, the inside gradient may be up to 11% or 12% for short distances. A portion of mining will occur in areas where mining benches are above the lowest crest point in the design. In some of these areas, haul roads have been designed inside of the ultimate pit footprint and ramps are not incorporated into the high-wall design. These haul roads provide access to upper benches and then are consumed as the pit is mined.

In the interior pit phases for the Hasbrouck Mine, a ramp is left in the high wall. These ramps are mined out by subsequent pit phases. Access to the upper benches of the ultimate pit is gained on the previous (phase 3) pit ramp left in the high wall, which is mined out in the final phase leaving a high wall without a ramp. After the pit is advanced below the lowest pit crest, ramp access is carried in the pit design.

The design anticipates the use of 100-ton trucks. The ramp widths are based on the Caterpillar 777 style trucks with an operating width of 20 ft. Haul roads are generally designed to be 90 ft wide, which allows for 3.35 times the width of the truck for running width, plus another 23 ft for a single berm at least half the tire height.

In the lower portion of the Three Hills ultimate pit, a slot cut is driven 80 ft wide. This is used as a ramp, and the width is the minimum mining width. As the slot cut will not require berms, the width is sufficient for 2-way traffic.

Haulage outside of the pit is required to deliver material to the waste dumps and heap leach pad at Three Hills, and to the crusher or coarse stockpile at the Hasbrouck Mine. In cases where these roads require a berm on each side, the road design width is 115 ft. This allows for 69 ft of running width.

15.3.4 ULTIMATE PIT DESIGNS

Ultimate pit designs were developed for both the Three Hills and Hasbrouck mines. The ultimate pit for Three Hills is shown in Figure 15-3. The pit extends from the bottom elevation of 5,620 ft to the upper crest at 5,990 ft. The pit extents are approximately 1,400 ft east to west and 2,125 ft north to south.

The ultimate pit for Hasbrouck is shown in Figure 15-4. The top of Hasbrouck Mountain is about 6,270 ft in elevation and the most upper crest of the ultimate pit is at approximately 5,960 ft. The lowest bench of the ultimate pit is at 5,400 ft elevation. The pit extents are approximately 2,500 ft east to west and 1,900 ft north to south.

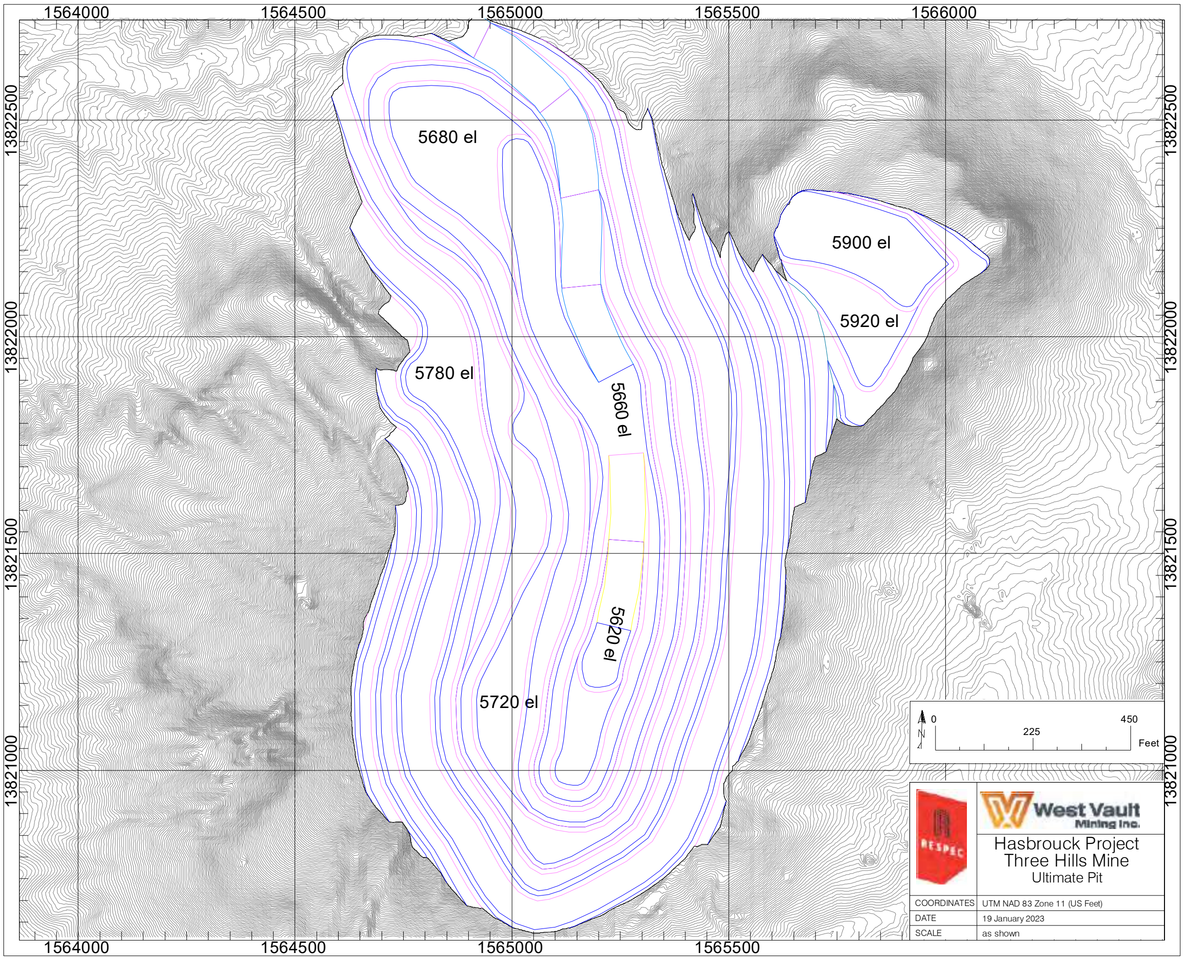

Figure 15-3. Three Hills Ultimate Pit Design

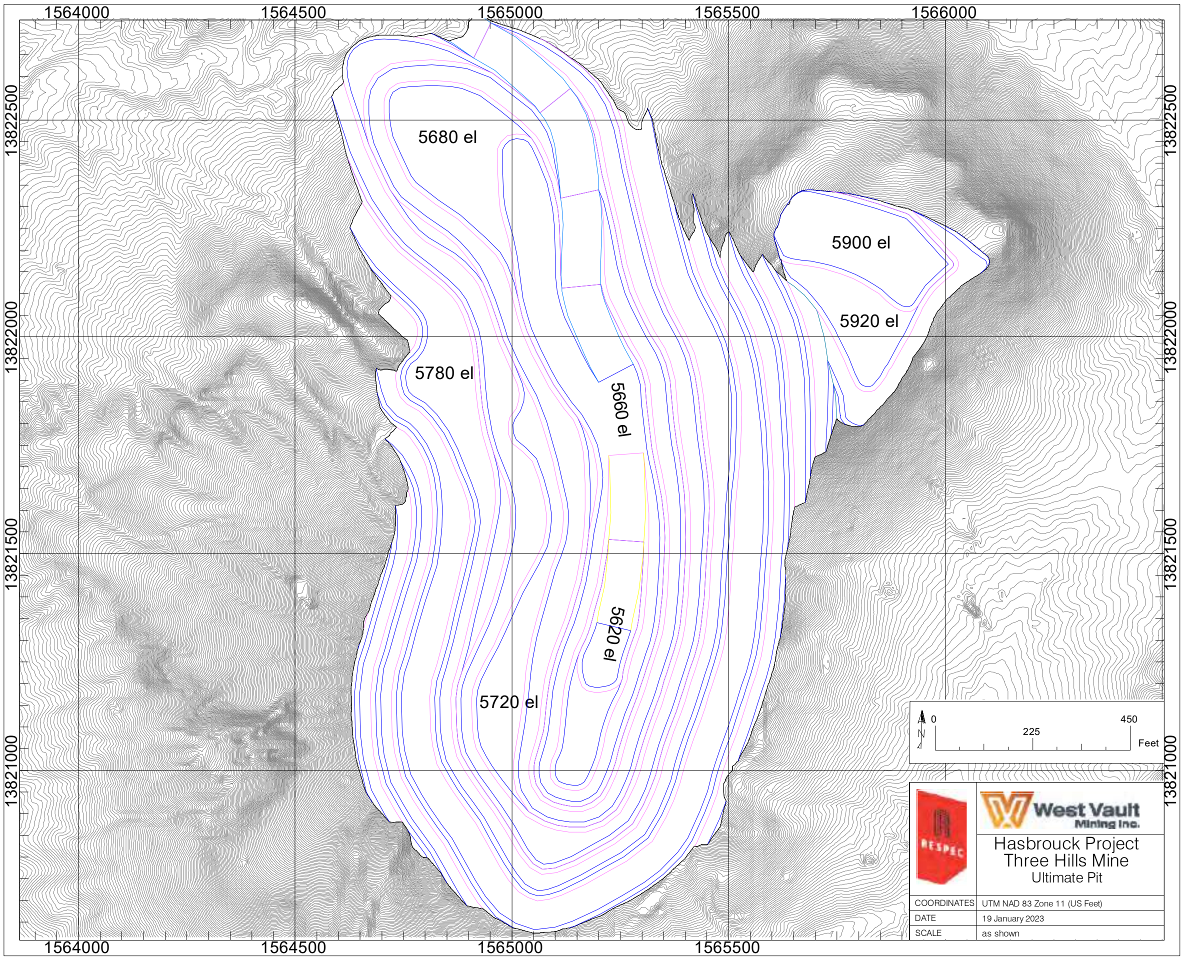

Figure 15-4. Hasbrouck Mine Ultimate Pit Design (Phase 4)

15.3.5 PIT PHASING

The Three Hills pit was divided into 5 phases in order to sequence the mining of construction materials followed by ore. The pit phases are shown in Figure 15-5 and are described as follows:

- Phase 1: Consists primarily of Brougher Rhyolite to be used for leach-pad over-liner material and some access road material. Phase 1 does not contain any ore as defined and is mined solely to provide construction material.
- Phase 2: This contains a mixture of Brougher Rhyolite and Siebert waste material to be used for access roads and fill around the leach pad, ponds, and roads. Phase 2 does not contain any ore, and is also used only to provide construction material.
- Phase 3: Mines ore and waste from the top of the southern hill down to the 5,880 ft elevation.
- Phase 4: Mines ore and waste from the top of the northern hill down to the 5,880 ft elevation.
- Phase 5: Mines the remaining ore and waste to complete the ultimate pit.

Note that Phase 1 was designed to include only Brougher Rhyolite material and to be mined approximately 300 ft to the east of the existing fiber optic cable that runs through the proposed ultimate pit. This allows for mining of this material prior to moving the fiber optic cable. This was done to facilitate the construction mining schedule.

It should also be noted that the Phase 1 pit design was created outside of the optimized pit shell to provide the Brougher Rhyolite material. In all, a total of 347,000 tons of additional waste is mined due to this requirement. Additional testing is yet to be completed on the Oddie Rhyolite formation to determine if it would be suitable for construction materials. Should this be successful, some of the additional waste may be reduced.

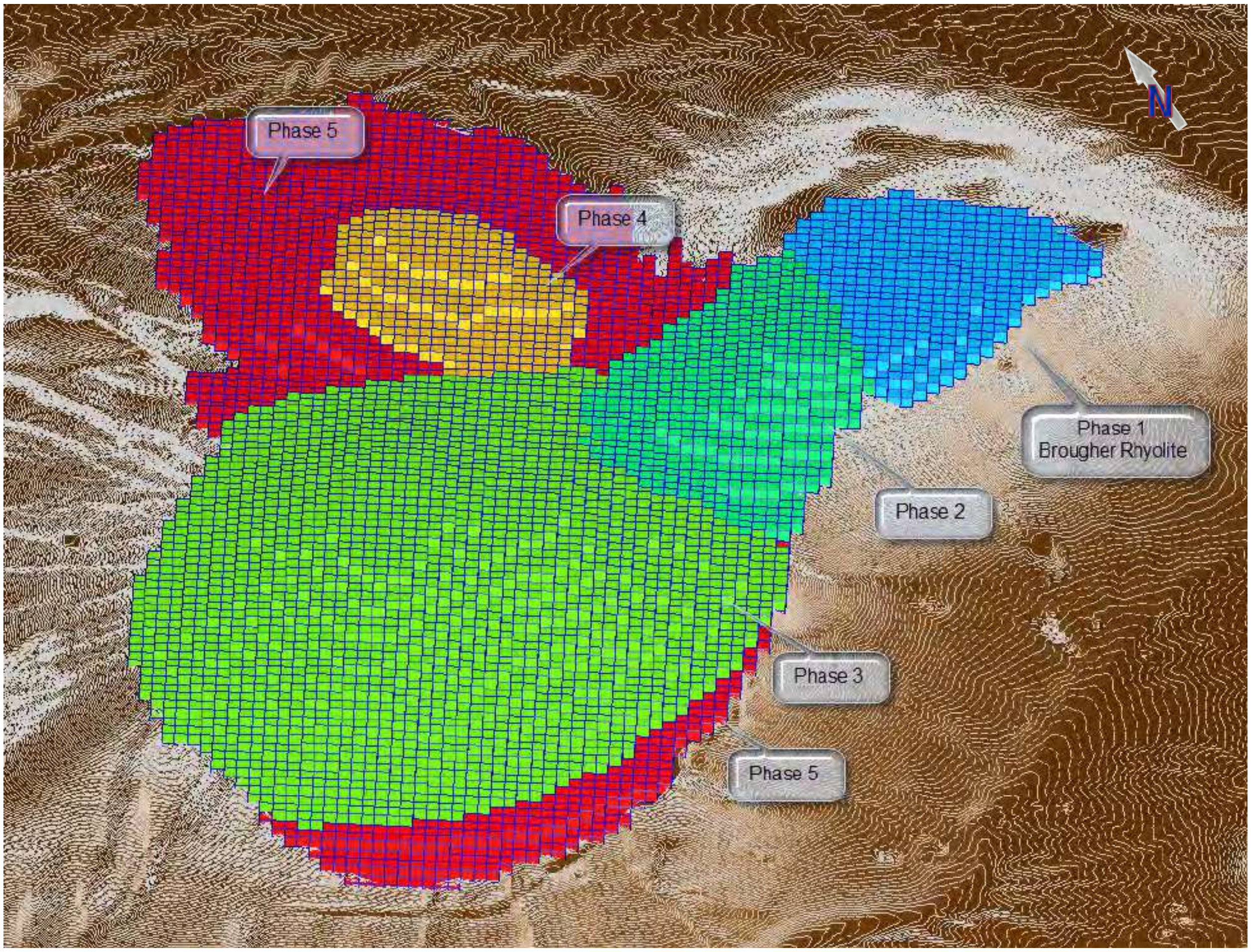

Figure 15-5. Perspective View of Three Hills Mine Mining Sequence
(Perspective View of Three Hills Pit Phases; RESPEC 2016)
Note: Not to scale

Hasbrouck Mine was designed to achieve the ultimate pit using 4 pit phases. These start at the top of the mountain and mine downward. The pits primarily work from west to east. The 4 pit phases are described as follows:

/ Phase 1: Start mining on the top of the mountain at 6,270 ft elevation. The bottom bench of Phase 1 is at 5,700 ft elevation. Access will be developed on the surface inside the pit boundary, and then mined out as Phase 1 is mined down. The uppermost crest that is left behind is at the 6,170 ft elevation. A ramp is left in the southeast high wall of the pit for easy access to Phase 2. The Phase 1 pit design is shown in Figure 15-6.

/ Phase 2: Mining starts at the crest of Phase 1 (the 6,170 ft elevation) and mines down to the bottom of Phase 2 at the 5,600 ft bench. The upper most crest of Phase 2 is at approximately 6,110 ft in elevation. Phase 2 pit design is shown in Figure 15-7.

- Phase 3: Mining starts at the crest of Phase 2 (the 6,100 ft bench) and continues to phase 3's ultimate depth at the 5,440 ft elevation. Access is gained using the Phase 2 ramp that was left behind. Again, a ramp is left in the high wall of Phase 3 to provide access for Phase 4. Phase 3 pit design is shown in Figure 15-8.
- Phase 4: Mining starts at the Phase 3 crest on the 6,060 ft bench. Phase 4 achieves the ultimate pit with the bottom bench located at the 5,400 ft elevation. This is the final pit phase, and no ramps are left in the final high wall. However, the wall is accessible every 120 ft in height from the crest via the 65 ft wide geotechnical benches. The ultimate pit shown in Figure 15-4 represents the Phase 4 design.

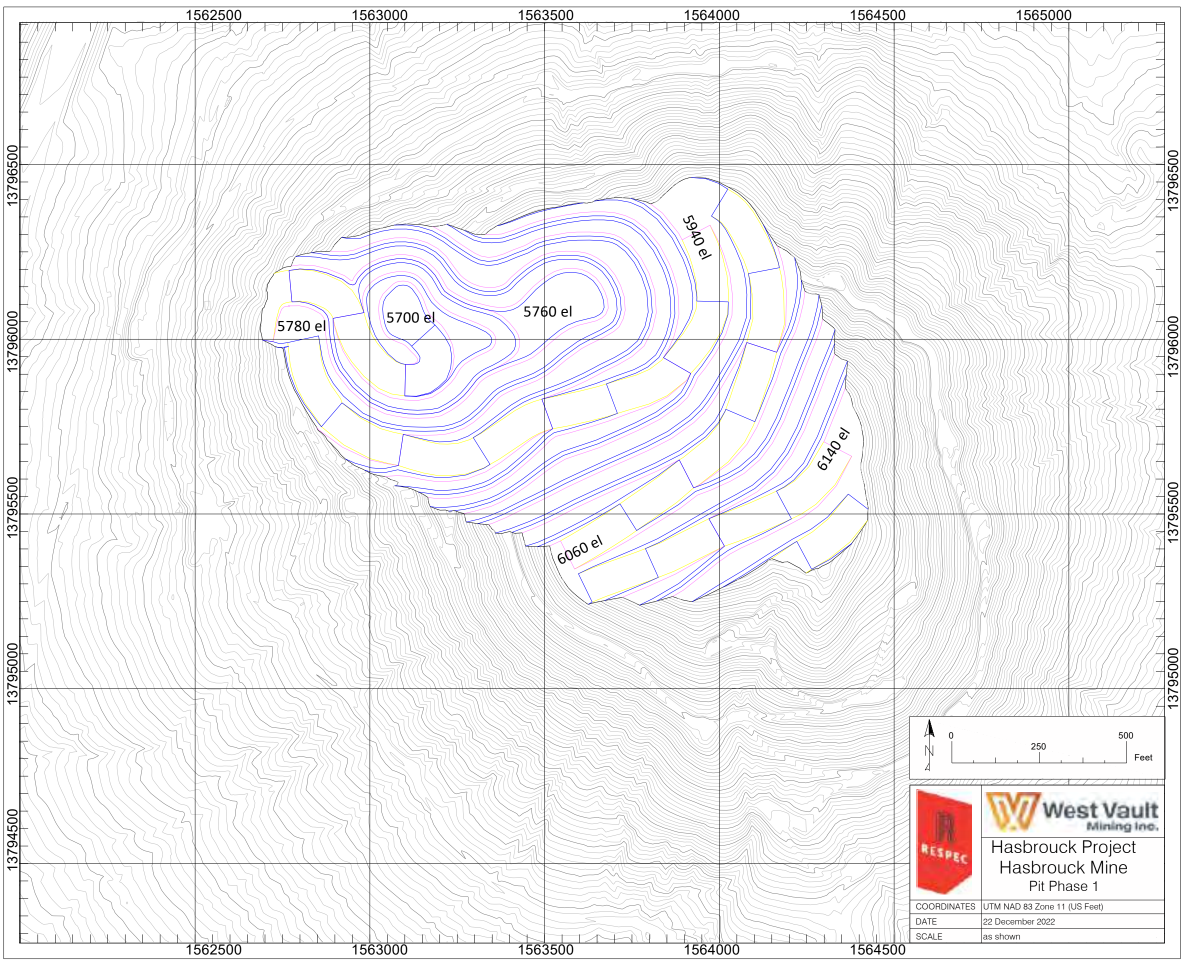

Figure 15-6. Hasbrouck Mine Phase 1 Pit Design

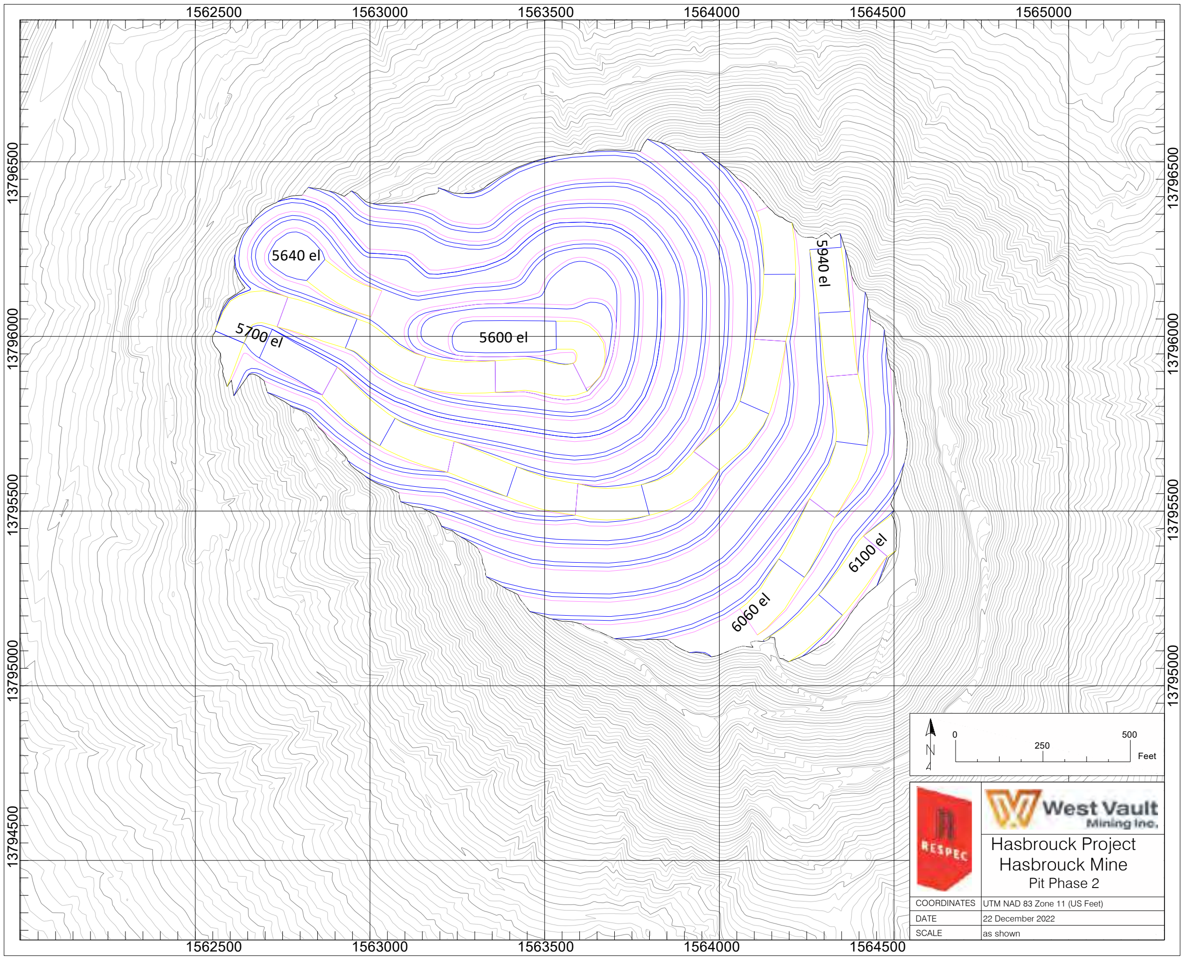

Figure 15-7. Hasbrouck Mine Phase 2 Pit Design

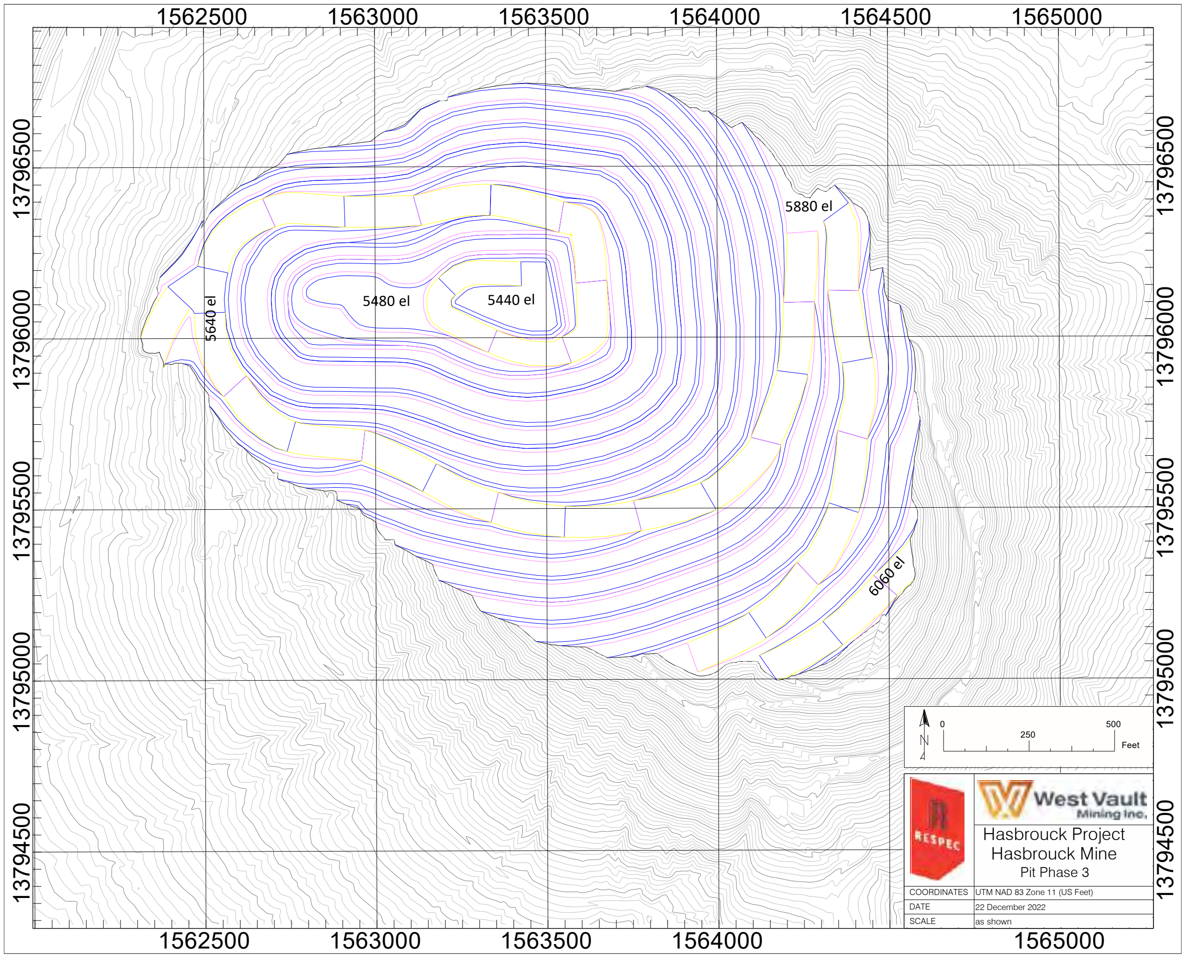

Figure 15-8. Hasbrouck Mine Phase 3 Pit Design

15.4 DILUTION

The Mineral Resource models for the Three Hills and Hasbrouck mines were created using 3-dimensional mineralized domains to confine the estimations by reporting grade and portion of each block within the various domains. The domains were then diluted back to the block size based on the contribution of each domain to the block. The Mineral Resource models have block dimensions of 20 ft long by 20 ft wide by 20 ft high for both Three Hills and Hasbrouck.

RESPEC believes that the 20 ft by 20 ft x20 ft block size is a reasonable selective mining unit, and because the Mineral Resource models have been diluted to the smallest mining unit ("SMU") size, RESPEC considers the dilution to have been reasonably accounted for statement of Mineral Reserves.

15.5 THREE HILLS AND HASBROUCK MINE PROVEN AND PROBABLE MINERAL RESERVES

Table 15-11 through Table 15-14 report the Proven and Probable Mineral Reserves for Three Hills and Hasbrouck mines, based on the pit designs discussed in previous sections. These Mineral Reserves are shown to be economically viable based on the Hasbrouck Project cash flows created for the PFS and RESPEC believes that they are reasonable for the statement of Proven and Probable Mineral Reserves. The reference point for the estimated Mineral Reserves is at the exit from the respective open pits at Three Hills and Hasbrouck mines. Summation discrepancies may be noticeable due to minor rounding issues.

Table 15-11. Three Hills Probable Mineral Reserves

Three Hills	K Tons	oz Au/ton	K Ozs Au
Probable	9,653	0.018	175

1. Mineral Reserves are estimated based on previously designed pits which have been validated using $1,750/oz gold and $21.50/oz silver (note the project cash-flow analysis uses 3-year rolling average prices of $1,790/oz gold and $22.50/oz Silver)
2. Three Hills Mineral Reserves are defined with a 0.005 oz Au/ton and a grade-dependent recovery equation for gold provided by Mr. Mark Jorgenson
3. The Mineral Reserves were created using CIM definitions.
4. Inferred Mineral Resources do not contribute to Mineral Reserves
5. No mining, metallurgical, infrastructure, or permitting factors that could materially affect the estimate are known to RESPEC.
6. Mineral Resources are inclusive of Mineral Reserves.

Table 15-12. Hasbrouck Proven and Probable Mineral Reserves

Hasbrouck Upper Siebert	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	1,189	0.021	25	0.420	499
Probable	4,441	0.018	80	0.313	1,391
Proven & Probable	5,630	0.019	105	0.336	1,890
Hasbrouck Lower Siebert					
Proven	4,942	0.021	101	0.417	2,058
Probable	23,798	0.016	372	0.275	6,555
Proven & Probable	28,740	0.016	473	0.300	8,614
Total Hasbrouck					
Proven	6,130	0.021	126	0.417	2,558
Probable	28,239	0.016	452	0.281	7,946
Proven & Probable	34,370	0.017	578	0.306	10,504

1. Mineral Reserves are estimated based on previously designed pits which have been validated using $1,750/oz gold and $21.50/oz silver (note the Project cash-flow analysis uses 3-year rolling average prices of $1,790/oz gold and $22.50/oz Silver)
2. Hasbrouck Mine Mineral Reserves use a variable gold recovery based on material in Upper Siebert and Lower Siebert lithologies along with depth below topography.
3. Hasbrouck Mine Mineral Reserves use a constant silver recovery of 24% and 17% in the Upper Siebert and Lower Siebert lithologies, respectively.
4. A minimum grade of 0.007 is used for both gold and silver.
5. Hasbrouck Mine Mineral Reserves use a gross metal value (GMV") cutoff of $5.17/T which includes the cost for processing and G&A
6. The Mineral Reserves were created using CIM definitions.
7. Inferred Mineral Resources do not contribute to Mineral Reserves and are treated in the same way as waste.
8. No mining, metallurgical, infrastructure, or permitting factors that could materially affect the estimate are known to RESPEC.
9. Mineral Resources are reported inclusive of Mineral Reserves.

Table 15-13. Combined Three Hills and Hasbrouck Proven and Probable Mineral Reserves

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	6,130	0.021	126	0.417	2,558
Probable	37,893	0.017	627	0.210	7,946
Proven & Probable	44,023	0.017	753	0.239	10,504

Some summation discrepancies may be noticeable to minor rounding issues.

See footnotes in Table 15-12 in respect of assumptions and cautions related to the Mineral Reserves.

Table 15-14. Proven and Probable Mineral Reserves and Stripping by Pit Phase

		Proven Reserves					Probable Reserves					Proven & Probable Reserves					Waste	Total	Strip
	Pit	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio
Three Hills	Ultimate Pit	-	-	-	-	-	9,653	0.018	175	-	-	9,653	0.018	175	-	-	8,331	17,984	0.86
Hasbrouck	Phase 1	2,386	0.026	62	0.509	1,213	6,909	0.019	134	0.315	2,180	9,295	0.021	196	0.365	3,393	6,179	15,474	0.66
	Phase 2	1,659	0.020	34	0.477	791	7,092	0.018	125	0.320	2,273	8,751	0.018	159	0.350	3,063	9,137	17,888	1.04
	Phase 3	1,247	0.013	16	0.301	376	8,627	0.014	117	0.281	2,420	9,874	0.013	133	0.283	2,796	10,601	20,475	1.07
	Phase 4	839	0.017	14	0.212	178	5,611	0.013	75	0.191	1,074	6,450	0.014	89	0.194	1,252	14,932	21,382	2.32
	Total	6,130	0.021	126	0.417	2,558	28,239	0.016	452	0.281	7,946	34,370	0.017	578	0.306	10,504	40,849	75,219	1.19
All Deposits	Total	6,130	0.021	126	0.417	2,558	37,893	0.017	627	0.210	7,946	44,023	0.017	753	0.239	10,504	49,180	93,203	1.12

See footnotes in Table 15-12 in respect of assumptions and cautions related to the Mineral Reserves.

15.5.1 THREE HILLS AND HASBROUCK MINES IN-PIT INFERRED MINERAL RESOURCES

Inferred Mineral Resources at both Three Hills and Hasbrouck mines were considered as waste and not used in the economic analysis. The CIM definition of Inferred Mineral Resources is given below, with CIM's explanatory material shown in italics:

> An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.
>
> An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
>
> *An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.*
>
> *There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the Disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.*

In-pit Inferred Mineral Resources have been tabulated for Three Hills Mine inside of the ultimate PFS pits using a 0.005 oz Au/ton cut-off grade total 342,000 tons with an average grade of 0.007 oz Au/ton for a total of 2,000 contained ounces.

Hasbrouck Mine in-pit inferred Mineral Resources were tabulated inside of the Hasbrouck ultimate PFS pits using a 0.007 per ounce minimum grade for both silver and gold and a $5.17/ton GMV cutoff to cover processing and G&A costs. The total in-pit inferred Mineral Resources for Hasbrouck are 2,407,000 tons with an average grade of 0.011 oz Au/ton and 0.162 oz Au/tonfor gold and silver respectively. The total Hasbrouck in-pit contained inferred Mineral Resources contain 27,000 ounce of gold and 390,000 ounces of silver.

16.0 MINING METHODS

The pre-feasibility for the Hasbrouck Project includes mining at both Three Hills Mine and Hasbrouck Mine. These are planned as open-pit, truck and loader operations. The truck and loader method provides reasonable costs and selectivity for these deposits. Only open pit mining methods are considered for mining at the Hasbrouck Project.

16.1 DEFINITION OF MINE MATERIAL TYPES

For production scheduling, material types were classified into ore or waste categories. Ore consists of only Proven and Probable Mineral Reserves. For Hasbrouck Mine, these are further divided into upper and Lower Siebert ore, which have been tracked separately to recognize their different metallurgical recoveries and a tag is placed at the end of the material type to identify the royalty zone the material is mined from. All ore is oxide.

Waste material was defined as all material inside of the pit designs that did not meet Proven and Probable Mineral Reserve classifications. For Three Hills, waste was further divided into Brougher Rhyolite and other waste. All Inferred material was considered waste. A total of 8,331,000 tons of waste have been defined at Three Hills and 40,849,000 tons have been defined at Hasbrouck. Table 15-14 in Section 15.5 shows the tons of ore and waste to be mined by pit.

16.2 MINE ROADS AND EQUIPEMENT ACCESS

In-pit ramp dimensions were discussed previously in the Mineral Reserves section of this report. Haulage routes constructed outside of the pit were designed to allow for two-way traffic. Sufficient running surface is to be maintained to allow for about 3.5 times the width of the haul trucks, and a sufficient berm at least half of the tallest tire of any vehicle using the road will have to be maintained. Roads outside of the pit that have a hill or dump next to them will require about 90 ft minimum width (including the berm), and roads where two berms are to be maintained will require 115 ft of width or more (also including berm widths).

The main haul roads from the pit exit to the crusher pad have been designed using gradients between 5% and 8%.

16.3 WASTE ROCK STORAGE AREAS

16.3.1 GEOTECHNICAL ASPECTS OF WASTE ROCK STORAGE AREAS

The waste rock storage areas ("WRSAs") at the Three Hills site were investigated during the September 2014 geotechnical field investigation. Five test pits were excavated within the footprint of the proposed facility. The WRSA is currently sited along the west slopes of the topographic feature that is identified as Three Hills. The upper portions of the WRSA will be founded on bedrock and the lower portions are founded on granular soils located along the base of Three Hills. Bedrock within the footprint of the WRSA is composed of rhyolite and tuff. The tuff is the same rock unit that underlies the HLF and is described as weak to extremely weak, slightly to moderately weathered, and relatively unfractured. When highly weathered or pulverized, the bedrock exhibited low plasticity. The rhyolite is described as slightly to moderately weathered, welded, and medium strong with localized strong silicified zones. The tuff is considered rippable with an appropriately sized dozer, while the rhyolite is considered marginally rippable with localized non-rippable zones.

Soils encountered along the base of the Three Hills slopes are described as silty and clayey sands, likely reworked from the volcanic tuff. Bedrock was encountered within 2 ft of the ground surface for most of the test pits, with one test pit that encountered bedrock 8 ft below ground surface. Roots were present approximately 2 ft below ground surface. Groundwater is not anticipated to influence the design, construction, or operation of the waste rock storage areas.

The WRSAs at the Hasbrouck Mine will be sited along the south and east slopes of Hasbrouck Peak. It is anticipated the upper portions of the WRSAs will be founded directly on bedrock, and on granular soils in the lower portions of the WRSAs. Shallow bedrock is anticipated in areas of surficial soil cover. The areas along the base of Hasbrouck Peak are mapped as alluvial deposits and form the northern perimeter of the broad alluvial drainages that transmit water during periods of heavy precipitation. Bedrock along the slopes of Hasbrouck Peak is mapped as volcanic tuff and is anticipated to be of similar properties to the tuff observed at the Three Hills site. Groundwater is not anticipated to influence the design, construction, or operation of the WRSAs at the Hasbrouck Mine, as it is at considerable depth.

16.3.2 WASTE ROCK STORAGE AREA DESIGNS

Mined waste will initially be used as fill for construction in areas as required, such as for roads, leach pads, and for fill around the crusher. For the Hasbrouck Mine, some waste may be used for berm construction to contain rock that may roll off the mountain during initial mining.

Mine waste storage has been designed as a single facility for Three Hills and two waste facilities for Hasbrouck (East and South waste rock storage areas). Three Hills waste storage area includes a haul road leading from the base of the dump in the north to the upper dump lifts. This road has been designed with a 90-foot-wide ramp at less than 10% gradient to provide two-way haul truck access. In addition, the lower portion of the dump contains a built-in haul road that leads around the base of the dump to the ROM heap leach pad.

The Three Hills waste dump was designed to be constructed from the base up, starting with dumping of waste material to define the haul road to the leach pad. The dump would then be constructed in 20 ft to 40 ft lifts depending on the efficiency and operations preference. The dump design assumes a 34° dump face and leaves catch benches 40 ft wide for every 40 ft in dumping height. This gives an inter-ramp slope of about 2.5H:1V. The overall slope of the dump is approximately 3.0H:1V and minimizes the effort required for reclamation at that overall slope. The Three Hills waste storage area is shown in Section 18.1 (Figure 18-1) and in the yearly pit position maps in Appendix B.

The Hasbrouck east waste rock storage area will be used primarily for waste mined from the upper benches in each phase, and thereafter the south waste storage area will be used as the main waste storage area. The east waste dump will be accessed from roads developed directly off the upper mining benches over to the upper portion of the waste dump. It is currently envisioned that the dump will be built by starting from the upper benches, so no ramps are built into the lower portions. Dumping will begin at the crest of the designed dump and continue until a dumping face ranging between 50 ft and 100 ft tall is developed. RESPEC believes that lifts up to 100 ft tall can be safely dumped in this manner; however, it will be important to monitor these dump faces for stability during operation to ensure safety.

Once the upper lift has been dumped to a height of 100 ft, a road will be established to the base of the dump, or slightly higher, where a second lift will be established and built out in a similar fashion. Once the lower lift has been dumped in, dumping can be continued on the upper lift. A dump toe is to be established by leaving a berm on the lower lift so that waste dumped from the upper lift is contained leaving room for a 76 ft wide catch bench. This will allow for the return of truck traffic to the lower lift if additional dumping is to be done and allows for grading of the dump to a 3H:1V slope during final reclamation.

The east waste storage area has been designed to have a height of up to 330 ft from the final crest to the lowest dump toe. The east waste storage area is shown in Section 18.1 (Figure 18.2) and in the yearly pit position maps in Appendix C.

The Hasbrouck south waste storage area is designed to be just south of the main haul road that comes out of the pit exits as shown in Section 18.1 (Figure 18.2) and in the yearly pit position maps in Appendix C. The road is intended to be the upper boundary of the dump and to provide access for equipment onto the various lifts. The dump will be constructed in the same manner as described for the east dump, dumping from the top until a 100 ft lift height is established. Then a second lift will be started at, or just above, the dump toe and extended to the south until it has reached a desired lift height.

The Hasbrouck south waste storage area has been designed to have a height of up to 360 ft from the final crest to the lowest dump toe.

Lift heights will need to be monitored to maintain a safe dump face. When dumping, the lift gradient should rise toward the dump face between 2% and 4% to allow for settling and solidification of the dump floor. The dump face should be tended to by a dozer to maintain a proper berm to keep trucks from backing over the edge. The dozer operator should be trained to watch for issues such as cracking or sloughing at the dump face. It is important that a wide dump face is worked to allow time for settling and inspection.

16.4 STOCKPILES

Long term stockpiling strategies were not used for either Three Hills or Hasbrouck mines. All ore from Three Hills will be placed directly on the ROM leach pad by haul trucks. At the Hasbrouck Mine, the ore will be hauled and directly dumped into the crusher as much as possible. A short-term stockpile has been planned near the crusher for when the crusher temporarily cannot keep up with ore haulage, such as unexpected down time at the primary crusher. This stockpile will be re-handled by the contract miner as required. The estimated mining costs include a provision that up to 3.5% of the ore would be re-handled.

16.5 MINE-PRODUCTION SCHEDULE

The pre-feasibility study has been based on contract mining of Three Hills and Hasbrouck mines. The mine production schedule has been assuming the use of loaders and 100-ton class trucks.

Production scheduling was completed using Geovia's MineSched™ (version 9.6.2) software. Proven and Probable Mineral Reserves were used to schedule mine production, and Inferred Mineral Resources inside of the pit were considered as waste. Additional detail was given to the mining of waste material required for fill and leach-pad over-liner material to be used for construction at Three Hills.

16.5.1 THREE HILLS PRODUCTION SCHEDULE

Three Hills production schedules have been completed based on a 15,000 tpd production requirement for the ROM heap leach pad. As the ore is generally low grade, it may not be profitable to incur re-handling costs, so a major assumption was that stockpiles would not be used for Three Hills ore. In addition, a limit of 1 bench per month of mining was imposed, except for the upper few benches which were not confined by a pit crest and will be small in total tonnage. The 1 bench limit was used as a rule of thumb to ensure that the mining schedule allows for the development and mining of benches in a realistic fashion and not overly aggressive.

Detailed monthly schedules were created for the construction period based on construction requirements for heap-leach over-liner and fill material requirements defined by NewFields. Waste scheduled to be mined for construction includes:

- 235,000 cubic yards (334,000 tons) of Brougher Rhyolite for over-liner material sent to a stockpile for crushing;
- 24,000 cubic yards (34,000tons) of Brougher Rhyolite sent to a stockpile for crushing prior to use for coarse road surfacing material;
- 134,000 cubic yards (185,000 tons) of fill material for fill around pond and plant facilities;
- 42,000 cubic yards (59,000 tons) of fill material for the heap-leach facility; and
- 69,000 cubic yards (90,000 tons) of fill material for roads.

In total, 504,000 cubic yards (702,000 tons) of waste material is now scheduled for construction purposes. The density of the material is assumed from the bulk density from the block model. A net swell factor of 1.3 was assumed based on about 1.4 through mining, followed by subsequent compaction when placed.

Construction material is mined from Three Hills phases 1 and 2, which corresponds to months -9 through -4. Production mining starts in month -2.

The production schedule was produced using monthly periods. Ore placed on the pad had a lag time applied so that gold production was not assumed at time of placement. The lag time was developed by RESPEC in coordination with Mark Jorgensen and Carl Defilippi of KCA, who are QP's for the metallurgy and processing sections of this report, respectively. The schedule assumed that the full extraction of recoverable gold placed on the pad would take up to 7 months. The operational recovery used a grade dependent recovery as discussed in Section 15.2.1 and the average LOM recovery was 82.7%.

Three Hills mine production schedule is shown in Table 16-1.

Table 16-1 Three Hills Mine Production Schedule

		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Th_Ph_1	Ore Mined	K Tons	-	-	-	-	-	-	-	-	-	-	-
		oz Au/ton	-	-	-	-	-	-	-	-	-	-	-
		K Ozs Au	-	-	-	-	-	-	-	-	-	-	-
	Pit to Dump	K Tons	370	-	-	-	-	-	-	-	-	-	370
	Total Tons	K Tons	370	-	-	-	-	-	-	-	-	-	370
	Strip Ratio	W:O	NA										NA
Th_Ph_2	Ore Mined	K Tons	-	-	-	-	-	-	-	-	-	-	-
		oz Au/ton	-	-	-	-	-	-	-	-	-	-	-
		K Ozs Au	-	-	-	-	-	-	-	-	-	-	-
	Pit to Dump	K Tons	545	-	-	-	-	-	-	-	-	-	545
	Total Tons	K Tons	545	-	-	-	-	-	-	-	-	-	545
	Strip Ratio	W:O	NA										NA
Th_Ph_3	Ore Mined	K Tons	540	2,496	-	-	-	-	-	-	-	-	3,036
		oz Au/ton	0.014	0.012	-	-	-	-	-	-	-	-	0.013
		K Ozs Au	8	30	-	-	-	-	-	-	-	-	38
	Pit to Dump	K Tons	51	1,759	-	-	-	-	-	-	-	-	1,810
	Total Tons	K Tons	591	4,255	-	-	-	-	-	-	-	-	4,846
	Strip Ratio	W:O	0.09	0.70									0.60
Th_Ph_4	Ore Mined	K Tons	-	146	-	-	-	-	-	-	-	-	146
		oz Au/ton	-	0.016	-	-	-	-	-	-	-	-	0.016
		K Ozs Au	-	2	-	-	-	-	-	-	-	-	2
	Pit to Dump	K Tons	-	36	-	-	-	-	-	-	-	-	36
	Total Tons	K Tons	-	182	-	-	-	-	-	-	-	-	182
	Strip Ratio	W:O		0.25									0.25
Th_Ph_5	Ore Mined	K Tons	-	2,807	3,664	-	-	-	-	-	-	-	6,471
		oz Au/ton	-	0.018	0.023	-	-	-	-	-	-	-	0.021
		K Ozs Au	-	52	83	-	-	-	-	-	-	-	134
	Pit to Dump	K Tons	-	2,940	2,630	-	-	-	-	-	-	-	5,570
	Total Tons	K Tons	-	5,747	6,293	-	-	-	-	-	-	-	12,041
	Strip Ratio	W:O		1.05	0.72								0.86
Total Three Hills	Ore Mined	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
		oz Au/ton											0.018
		K Ozs Au	7.54	84.40	82.75	-	-	-	-	-	-	-	175
	Pit to Dump	K Tons	966	4,735	2,630	-	-	-	-	-	-	-	8,331
	Total Tons	K Tons	1,506	10,185	6,293	-	-	-	-	-	-	-	17,984
	Strip Ratio	W:O	1.79	0.87	0.72								0.86

16.5.2 HASBROUCK PRODUCTION SCHEDULE

Hasbrouck production schedules were completed based on a 17,500 tpd production requirement. As mentioned previously, no long-term stockpiles were assumed for Hasbrouck, and all ore is to be delivered to the crusher. A short-term stockpile is planned near the crusher so that when the crusher is not available, trucks can dump without delay.

The production schedule for Hasbrouck was produced using monthly periods, and like Three Hills, a lag time for gold recovery was applied to ore sent through the crusher. The schedule assumed that the full extraction of recoverable gold placed on the pad would take 8 months. Recoveries were estimated based on depth dependent equations provided by Mr. Jorgensen. The LOM average recovery for Upper Siebert ore was estimated to be 55.2% gold recovery and Lower Siebert was estimated to be 75.9% gold recovery. The Upper Siebert silver recovery was estimated at 24% and the Lower Siebert silver recovery was estimated to be 17% with both silver recoveries using the same lag time as the gold recoveries.

All waste material will be hauled to waste dumps as previously described for both Three Hills and Hasbrouck mines, except that material needed for construction.

The Hasbrouck Mine production schedule is shown in Table 16-2.

Table 16-2 Hasbrouck Mine Production Schedule

		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
HB_Ph_1	Ore Mined	K Tons	-	-	562	4,165	2,992	1,575	-	-	-	-	9,295
		oz Au/ton	-	-	0.013	0.019	0.022	0.028	-	-	-	-	0.021
		K Ozs Au	-	-	7	80	65	44	-	-	-	-	196
		oz Ag/ton	-	-	0.141	0.360	0.373	0.443	-	-	-	-	0.365
		K Ozs Ag	-	-	79	1,498	1,118	698	-	-	-	-	3,393
	Pit to Dump	K Tons	-	-	2,408	3,037	492	242	-	-	-	-	6,179
	Total Tons	K Tons	-	-	2,970	7,202	3,485	1,817	-	-	-	-	15,474
	Strip Ratio	W:O	-	-	4.28	0.73	0.16	0.15	-	-	-	-	0.66
HB_Ph_2	Ore Mined	K Tons	-	-	2	1,595	2,350	3,156	1,649	-	-	-	8,751
		oz Au/ton	-	-	0.008	0.014	0.018	0.020	0.020	-	-	-	0.018
		K Ozs Au	-	-	0	22	42	62	33	-	-	-	159
		oz Ag/ton	-	-	0.111	0.268	0.287	0.380	0.462	-	-	-	0.350
		K Ozs Ag	-	-	0	428	674	1,199	762	-	-	-	3,063
	Pit to Dump	K Tons	-	-	1,138	5,607	862	1,264	265	-	-	-	9,137
	Total Tons	K Tons	-	-	1,140	7,203	3,211	4,420	1,914	-	-	-	17,888
	Strip Ratio	W:O	-	-	632.17	3.51	0.37	0.40	0.16	-	-	-	1.04
HB_Ph_3	Ore Mined	K Tons	-	-	-	126	1,045	1,657	4,204	2,842	-	-	9,874
		oz Au/ton	-	-	-	0.010	0.012	0.013	0.013	0.015	-	-	0.013
		K Ozs Au	-	-	-	1	13	22	57	41	-	-	133
		oz Ag/ton	-	-	-	0.056	0.154	0.181	0.303	0.371	-	-	0.283
		K Ozs Ag	-	-	-	7	161	301	1,273	1,054	-	-	2,796
	Pit to Dump	K Tons	-	-	-	2,573	2,003	2,199	3,291	534	-	-	10,601
	Total Tons	K Tons	-	-	-	2,699	3,049	3,857	7,494	3,376	-	-	20,475
	Strip Ratio	W:O	-	-	-	20.45	1.92	1.33	0.78	0.19	-	-	1.07
HB_Ph_4	Ore Mined	K Tons	-	-	-	-	-	-	535	3,563	2,352	-	6,450
		oz Au/ton	-	-	-	-	-	-	0.010	0.013	0.017	-	0.014
		K Ozs Au	-	-	-	-	-	-	5	45	39	-	89
		oz Ag/ton	-	-	-	-	-	-	0.020	0.133	0.326	-	0.194
		K Ozs Ag	-	-	-	-	-	-	11	475	766	-	1,252
	Pit to Dump	K Tons	-	-	-	-	-	-	5,045	8,582	1,305	-	14,932
	Total Tons	K Tons	-	-	-	-	-	-	5,580	12,145	3,656	-	21,382
	Strip Ratio	W:O	-	-	-	-	-	-	9.43	2.41	0.55	-	2.32
Total Hasbrouck Mined	Ore Mined	K Tons	-	-	564	5,887	6,388	6,388	6,388	6,405	2,352	-	34,370
		oz Au/ton	-	-	0.013	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
		K Ozs Au	-	-	7	103	120	127	95	86	39	-	578
		oz Ag/ton	-	-	0.141	0.328	0.306	0.344	0.320	0.239	0.326	-	0.306
		K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
	Pit to Dump	K Tons	-	-	3,546	11,217	3,358	3,706	8,601	9,116	1,305	-	40,849
	Total Tons	K Tons	-	-	4,110	17,104	9,745	10,094	14,989	15,521	3,656	-	75,219
	Strip Ratio	W:O	-	-	6.29	1.91	0.53	0.58	1.35	1.42	0.55	-	1.19

16.5.3 COMBINED ANNUAL PRODUCTION SCHEDULE

The total Hasbrouck Project mine production schedule is shown in Table 16-3. Process annual production schedules are shown in Table 16-4. Yearly pit and dump positions are shown in Appendix B and Appendix C.

Table 16-3 Hasbrouck Project Total Mine Production Schedule

		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Total Hasbrouck Project	Ore Mined	K Tons	540	5,450	4,228	5,887	6,388	6,388	6,388	6,405	2,352	-	44,023
		oz Au/ton	0.014	0.015	0.021	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
		K Ozs Au	8	84	90	103	120	127	95	86	39	-	753
		oz Ag/ton	-	-	0.019	0.328	0.306	0.344	0.320	0.239	0.326	-	0.239
		K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
	Pit to Dump	K Tons	966	4,735	6,176	11,217	3,358	3,706	8,601	9,116	1,305	-	49,180
	Total Tons	K Tons	1,506	10,185	10,403	17,104	9,745	10,094	14,989	15,521	3,656	-	93,203
	Strip Ratio	W:O	1.79	0.87	1.46	1.91	0.53	0.58	1.35	1.42	0.55		1.12
	Rehandle	K Tons	-	-	-	327	641	639	639	639	554	-	3,437

Table 16-4 Hasbrouck Project Total Process Production Schedule

Three Hills Leaching	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Material	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
Placed on	oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	
Pad	K Ozs Au	8	84	83	-	-	-	-	-	-	-	175
Recoverable	K Ozs Au	6	68	71	-	-	-	-	-	-	-	144
Recovered	K Ozs Au	-	54	88	2	-	-	-	-	-	-	144
Cumulative Recovery	%		59%	82%	83%							
Hasbrouck Mine Leaching												
Material	K Tons	-	-	564	5,887	6,388	6,387	6,388	6,405	2,352	-	34,370
Placed on	oz Au/ton	-	-	0.013	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
Pad	K Ozs Au	-	-	7	103	120	127	95	86	39	-	578
	oz Ag/ton	-	-	0.141	0.328	0.306	0.344	0.320	0.239	0.326	-	0.306
	K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
Recoverable	K Ozs Au	-	-	3	63	84	95	73	68	32	-	417
Recovered	K Ozs Au	-	-	1	49	80	97	77	67	46	-	417
Cumulative Recovery Au	%	0%	0%	12%	45%	56%	64%	67%	69%	72%		
Recoverable	K Ozs Ag	-	-	19	413	368	380	348	260	130	-	1,918
Recovered	K Ozs Ag	-	-	2	335	375	384	362	286	175	-	1,918
Cumulative Recovery Au	%	0%	0%	3%	17%	18%	18%	18%	18%	18%		
Total Hasbrouck Project Leaching												
Material	K Tons	540	5,450	4,228	5,887	6,388	6,387	6,388	6,405	2,352	-	44,023
Placed on	oz Au/ton	0.014	0.015	0.021	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
Pad	K Ozs Au	8	84	90	103	120	127	95	86	39	-	753
	oz Ag/ton	-	-	0.019	0.328	0.306	0.344	0.320	0.239	0.326	-	0.239
	K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
Recoverable	K Ozs Au	6	68	74	63	84	95	73	68	32	-	561
Recovered	K Ozs Au	-	54	89	50	80	97	77	67	46	-	561
Cumulative Recovery Au	%		59%	79%	68%	68%	70%	72%	72%	75%		
Recoverable	K Ozs Ag	-	-	19	413	368	380	348	260	130	-	1,918
Recovered	K Ozs Ag	-	-	2	335	375	384	362	286	175	-	1,918
Cumulative Recovery Au	%	0%	0%	3%	17%	18%	18%	18%	18%	18%		

16.6 CONSUMABLES

Major mining consumables include ANFO used in blasting operations and fuel used for equipment and blasting. Table 16-5 shows estimated ANFO and fuel consumptions. A fuel price of $3.25 per gallon was assumed for the estimation of mining costs based on recent contract mining quotations for a similar project. ANFO costs and controls will be the responsibility of the mining contractor. An ANFO cost of $550/ton delivered to site was used for the mining cost estimate.

Table 16-5 Major Mining Consumables

Blasting Consumables	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Bulk ANFO	Tons	140	955	971	1,605	910	943	1,400	1,450	342	-	8,718
Fuel Requirements												
Blasting	K Gal	2	11	11	18	10	11	16	17	4	-	100
Loading	K Gal	44	296	304	518	306	316	458	474	115	-	2,831
Haulage	K Gal	86	633	652	1,015	579	570	913	990	345	-	5,783
Total	K Gal	132	940	967	1,551	895	898	1,387	1,480	464	-	8,714

16.7 EQUIPMENT SELECTION AND PRODUCTIVITIES

The production schedules were established to mine required waste while fulfilling ore requirements to the leach pad or crusher. Mine production was scheduled assuming contractors would mine using Cat 992 style loaders and 100-ton capacity haul trucks. Three Hills mining productivity rates will vary between about 500,000 tons per month at startup, to around 900,000 tons of month during peak mining. Ramp up of production is done over about 4 months. Mining starts in month -9 to mine waste material required for over-liner material and construction fill. Production mining starts in Month -2, where both waste and ore are mined. The ore will be placed directly on the leach pad as soon as permission to load the pad is given by permitting agencies. The average mining rate is about 860,000 tons per month after ramping up of production. Maximum tons per day of 15,000 tons per day to the pad is assumed.

Mining rates at Hasbrouck were developed to supply a maximum of 17,500 tons per day to processing facilities. The maximum peak mining rate is about 1.4 million tons per month in year 3 with an average mining rate of 0.9 million tons.

Mining productivities assumed a mining schedule, equipment productivities, operating efficiencies, and availabilities. The following subsections describe the mine operating scheduled and productivity assumptions. Note that the final mine scheduling will be dictated by the mining contractor with WVM input.

16.7.1 MINE OPERATING SCHEDULE

The mine operating schedule assumes 2 shifts, 12-hours per shift, 365 days per year. The operating schedule assumes 6 days of holidays and 4 weather delay days per year. However, holidays will likely use skeleton crews to achieve production. Table 16-6 shows the yearly mine operating schedule. This includes estimates for standby and delay times. Overall, the shift operating efficiency, a measure of available work time in the shift compared to 12 hours per shift, is 87.5%. Yearly operating efficiency taking into consideration holidays and weather delays, is 85.1%.

Table 16-6 Mine Operating Schedule

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
	K Tons Mined	1,506	10,185	10,403	17,104	9,745	10,094	14,989	15,521	3,656	-	93,203
	K Tons Rehandle	-	-	56	589	639	639	639	641	235	-	3,437
	Total K Tons Moved	1,506	10,185	10,460	17,693	10,384	10,732	15,627	16,162	3,891	-	96,640
Mine Schedule – Standby Time	Days per Period	243	365	365	366	365	365	365	366	153	-	2,953
	Holidays per Period	4	6	6	6	6	6	6	6	3	-	49
	Weather Delays	3	4	4	4	4	4	4	4	-	-	31
	Days per Week	7	7	7	7	7	7	7	7	-	-	
	Shifts per Day	2	2	2	2	2	2	2	2	-	-	
	Hrs per Shift	12	12	12	12	12	12	12	12	-	-	
	Scheduled Hrs / Period	5,664	8,520	8,520	8,544	8,520	8,520	8,520	8,544	3,600	-	68,952
Mine Schedule – Delays / Efficiency	Lunch Breaks	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	-	
	Shift Startup / Shutdown	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	-	
	Breaks	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-	
	Safety / Training Hrs/Shift	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-	
	Misc - Blast & Move	-	-	-	-	-	-	-	-	-	-	
	Operator Hours after Misc	4,956	7,455	7,455	7,476	7,455	7,455	7,455	7,476	3,150	-	60,333
	Shift Operator Efficiency	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	0.0%	87.5%
	Schedule Operator Efficiency	85.0%	85.1%	85.1%	85.1%	85.1%	85.1%	85.1%	85.1%	85.8%	0.0%	85.1%

16.7.2 EQUIPMENT REQUIREMENTS

The final equipment requirements will be determined by the contract mining company which will be expected to include appropriate equipment to operate the Hasbrouck Project. Equipment requirements in this section was estimated by RESPEC so that the size of the equipment fleet and the impact on the operation are better understood. This allows for the comparison of estimates to that of the contractor when finalizing bids. The Equipment requirements were determined using the mine operating schedule and applying factors for operating efficiency, equipment availability, and productivity estimates. Estimated equipment requirements are shown in Table 16-7.

Table 16-7 Equipment Requirements

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Drill Requirements												
Number of Production Drills	#	1	2	2	4	2	2	4	5	2	-	5
Operating Efficiency	%	85%	85%	85%	85%	85%	85%	85%	85%	85%	0%	85%
Drill Availability	%	90%	89%	62%	88%	87%	86%	85%	85%	85%	0%	84%
Operating Hours	Op Hrs	1,365	11,013	10,748	18,497	10,535	10,912	16,204	16,780	3,953	-	100,008
Available Equipment Hours	Avail Hrs	3,326	13,333	9,785	21,325	12,934	12,785	18,921	19,564	4,837	-	116,811
Use of Available Equipment Hours	%	41%	83%	110%	87%	81%	85%	86%	86%	82%	0%	86%
Loader Requirements												
Number of Loaders	#	1	2	3	3	2	2	3	3	2	-	3
Operating Efficiency	%	85%	85%	85%	85%	85%	85%	85%	85%	85%	0%	85%
Loader Availability	%	90%	90%	88%	84%	80%	80%	81%	81%	79%	0%	83%
Operating Hours	Op Hrs	1,403	9,487	9,756	16,618	9,821	10,146	14,706	15,204	3,680	-	90,820
Equipment Hours	Eq Hrs	1,603	10,842	11,150	18,992	11,224	11,595	16,806	17,376	4,205	-	103,794
Available Equipment Hours	Op Hrs	4,460	13,363	14,348	19,818	19,538	19,377	19,147	19,126	8,033	-	137,210
Use of Available Equipment Hours	%	36%	81%	78%	96%	57%	60%	88%	91%	52%	0%	76%
Haulage Requirements												
Number of Trucks	#	4	5	8	8	8	8	10	10	7	-	10
Operating Efficiency	%	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	1.00	-	0.86
Truck Availability	%	0.90	0.89	0.88	0.88	0.87	0.86	0.86	0.86	1.00	-	0.88
Operating Hours	Op Hrs	4,312	31,568	32,514	50,596	28,846	28,444	45,522	49,340	17,214	-	288,356
Equipment Hours	Eq Hrs	4,929	36,078	37,159	57,824	32,967	32,507	52,025	56,388	17,337	-	327,213
Available Equipment Hours	Op Hrs	13,435	38,022	42,110	60,279	59,428	58,747	64,734	71,764	19,260	-	427,779
Use of Available Equipment Hours	%	37%	95%	88%	96%	55%	55%	80%	79%	90%	0%	76%
Support Equipment												
Water Truck - 20,000 Gallon	#	1	1	1	1	1	1	1	1	1	-	1
300 Kw Dozer (D9)	#	1	1	1	1	1	1	1	1	1	-	1
230 Kw Dozer (D8)	#	1	1	1	1	1	1	1	1	1	-	1
14' Motor Grader (14M)	#	1	1	1	1	1	1	1	1	1	-	1
50 ton Crane	#	1	1	1	1	1	1	1	1	1	-	1
Light Plants	#	1	3	3	3	3	3	3	3	3	-	3

16.7.3 DRILL & BLAST PRODUCTIVITY

Drilling productivities were based on the operating schedule, drill penetration rates, blast pattern dimensions, bit sizes, and non-drill time. Blast patterns were defined for production, trim row, and pioneer drilling. The bulk of the drilling for blasting operations is done with production drilling using 45,000-pound pull-down type rotary blast hole drills with 8.75-inch diameter drills. Trim-row blasting is a technique used for controlled blasting around the perimeter of the ultimate pit. This drilling is done using the production drills, but with a 6.75-inch drill bit. Pioneer drilling is only done at the start of mining using smaller drills that are more mobile. These drills are only used during the first two months of mining at each deposit and use a 4.75-inch drill bit.

Drilling parameters for production, trim-row, and pioneer drilling is shown in Table 16-8.

Penetration rates were estimated using the Bauer and Calder equation adjusted to achieve reasonable penetration rates based on RESPEC experience. Penetration rates of 78, 105, and 106 feet per hour were used for production, trim row, and pioneer drilling respectively.

Non-drill times account for the steel handling and setup and move times. A total of 1.70, 1.70, and 2.20 minutes were used for production, trim-row, and pioneer drilling.

Table 16-8 Blast-Hole Drilling Parameters

		Production	Trim Rows	Pioneering
	Units	Imperial	Imperial	Imperial
Bench Height	m/ft	20.0	20.0	20.0
Hole Diameter	mm/in	8.75	6.75	4.75
Spacing	m/ft	15.00	13.00	9.00
Burden	m/ft	15.00	13.00	9.00
Area of Influence	m^2/ft^2	225.00	169.05	80.99
Sub Drill	m/ft	5.00	4.30	3.00
Stemming	m/ft	10.00	8.67	6.00
Powder Colum	m/ft	15.01	15.65	17.01
Loading Density	kg/m - Lb/ft	4.96	2.95	1.46
Powder/hole	kg / lb	74.52	46.22	24.90
ANFO SG	SG	0.85	0.85	0.85
Emulsion SG	SG	1.10	1.10	1.10
% Emulsion Blend	%	30%	30%	30%
Rock SG	SG	2.70	2.70	2.70
Tonnes per Hole	tonnes/tons	379.5	285.1	136.6
Powder Factor	kg/tonne / lb/ton	0.196	0.162	0.182
Powder Factor	kg/m^3 / Lbs/ft^3	0.017	0.014	0.015

16.7.4 LOADING PRODUCTIVITY

Loading productivity assumes the use of CAT 100-ton trucks with CAT 992 style loaders. Bucket size of 15.2 cubic yards is assumed along with a fill factor of 95%. A cycle time of 50 seconds per bucket is assumed, and the loading assumes that trucks are loaded to full 100 wet-ton capacity. The loading productivity parameters and calculations are shown in Table 16-9.

Theoretical productivity is estimated to be 1,263 tons per hour and with operating efficiency of 85% is estimated to be 1,050 tons per hour.

Loader availabilities were assumed to start at 90% and then reduced 1% per year until a minimum of 85% is reached.

Table 16-9 Loading Productivity Calculations

Loading Parameters		992K 777G
Shovel Mech. Avail.	%	85%
Operating Efficiency	%	83%
Bucket Capacity	cy	16
Bucket Fill Factor	%	95%
Avg. Cycle Time	sec	50
Truck Parameters		
Truck Mech. Avail.	%	85%
Operating Efficiency	%	83%
Volume Capacity	cym	78.6
Tonnage Capacity	lt (Wet)	100
Truck Spot Time	sec	24
Truck Operating Width	m	5.98
Shovel Productivity		992K 777G
Effective Bucket Capacity	cyd	15.20
Tonnes per Pass - Wet	lst (Wet)	20.2
Tonnes per Pass - Dry	lst (Dry)	19.4
Theoretical Passes - Vol	passes	5.17
Theoretical Passes - Wt	passes	4.95
Actual Passes Used	passes	5.0
Truck Tonnage - Wet	wmt/load	100
Truck Tonnage - Dry	dmt/load	96
Truck Capacity Utilized - Vol	%	96%
Truck Capacity Utilized - Wt	%	100%
Load Time	min	4.57
Theoretical Productivity	dst/hr	1,263
Tonnes per Operating Hour	dst/hr	1,050
Tonnes per Day	dst/day	18,700
Potential - 355 day year	ton/year	6,638,500

16.7.5 HAUL TRUCK PRODUCTIVITY

Mine loading and haulage requirements were determined based on the amount of tonnage needed to be moved to achieve the desired process production rate. MineSched software was used to determine the truck hours and the number of trucks required to achieve production. Road centerlines were developed and input into MineSched to represent the haulage routes. Speeds were flagged into the centerlines based on CAT 777 performance curves. Maximum speed limits were set to:

- Level travel – 30 mph (downhill gradient less than 4%);
- Downhill loaded – 25 mph; and
- Downhill empty – 30 mph.

Uphill travel on ramps is governed by the truck performance curve. Bench travel was assumed to be 12 mph.

Haul truck efficiencies were assumed to be 85% of available working time. Availabilities assumed a starting point of 90% for new fleets declining at 1% per year down to a low of 85%. Haulage truck hours calculated in MineSched ("MS Hrs") are shown in Table 16-10 for ore and waste by deposit. Haul cycle times include 4.70 minutes spot and load time and 1.00 minute turn and dump time per 90 ton load. Productivity calculations assumed 100-ton trucks would carry 90 dry tons per load to coordinate the tonnage with dry tonnage in the Mineral Resource model. Haul cycles for stockpile re-handle of 8.70 minutes per load were assumed which includes load, spot, and dump times.

Note that the MS Hrs were theoretical or productive hours without any operational interruptions. Operating hours were calculated from the productive hours by dividing them by the operational efficiency of 85%. Further, the equipment hours assumed that the trucks would be running through standby time determined from the mine operating schedule. Thus, the equipment hours used to determine haulage equipment cost were calculated by dividing the operating hours by 87.5% shift operator efficiency.

Table 16-10 Haulage Hours and Cycle Times

	Material	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Three Hills Mining	Waste	MS Hrs	1,937	10,568	6,445	-	-	-	-	-	-	-	18,950
	Ore	MS Hrs	1,728	16,265	10,637	-	-	-	-	-	-	-	28,630
	Waste	K Tons	966	4,735	2,630	-	-	-	-	-	-	-	8,331
	Ore	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
	Waste	CT Min	5.13	6.40	7.53	-	-	-	-	-	-	-	6.61
	Ore	CT Min	11.58	10.68	9.98	-	-	-	-	-	-	-	10.46
Hasbrouck Mining	Waste	MS Hrs	-	-	8,062	27,373	9,058	9,265	22,472	23,747	5,399	-	105,377
	Ore	MS Hrs	-	-	2,403	14,685	14,432	13,883	15,192	17,160	8,854	-	86,608
	Waste	K Tons	-	-	3,546	11,217	3,358	3,706	8,601	9,116	1,305	-	40,849
	Ore	K Tons	-	-	564	5,887	6,388	6,388	6,388	6,405	2,352	-	34,370
	Waste	CT Min	-	-	6.58	7.48	8.87	7.76	8.39	8.21	1.14	-	7.69
	Ore	CT Min	-	-	17.30	7.77	6.50	5.94	6.33	8.11	1.04	-	6.69
Total Mining	Waste	MS Hrs	1,937	10,568	14,507	27,373	9,058	9,265	22,472	23,747	5,399	-	124,327
	Ore	MS Hrs	1,728	16,265	13,039	14,685	14,432	13,883	15,192	17,160	8,854	-	115,238
	Waste	K Tons	966	4,735	6,176	11,217	3,358	3,706	8,601	9,116	1,305	-	49,180
	Ore	K Tons	540	5,450	4,228	5,887	6,388	6,388	6,388	6,405	2,352	-	44,023
	Waste	CT Min	5.13	6.40	6.98	7.48	8.87	7.76	8.39	8.21	1.14	-	7.51
	Ore	CT Min	11.58	10.68	10.95	7.77	6.50	5.94	6.33	8.11	1.04	-	7.51

16.7.6 SUPPORT AND MAINTENANCE EQUIPMENT

Support and maintenance equipment assumed 85% availability, 85% operating efficiency, and a utilization factor based on RESPEC experience. The utilization factors were intended to reflect the amount of use required based on the equipment type. The following utilization was used for support and maintenance equipment:

- Water truck – 50% utilization;
- D9 Dozer – 50% utilization;
- D8 Dozer – 50% utilization;
- 14G Grader – 70% utilization;

- 50-ton Crane – 16% utilization (includes 40% utilization during construction periods followed by 10% utilization during operations);
- Light Plants – 85% utilization;
- Lube Truck – 70% utilization;
- Service / Mechanic Truck – 70% utilization;
- Tire Truck – 50% utilization; and
- Flat Bed Truck – 15% utilization.

16.8 MINING PERSONNEL AND STAFFING

It is anticipated that the mining contractor will have between 60 and 80 operators and staff involved with the operation. It has been assumed that the contractor will work between 12-hour shifts, 2 shifts per day, 7 days per week. The contractor will supply personnel and equipment as required to ensure ore flow is available 24 hours per day and 7 days per week to process facilities.

Other mine personnel will be employed by the owner for general activities, including mine supervision, engineering, surveying, geology, and ore control. Table 16-11 list the personnel requirements by department. Process personnel requirements were estimated by KCA.

Table 16-11 Owners General Mine Personnel

Administration	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Mine General Manager	K USD	$ 226	$ 246	$ 246	$ 246	$ 246	$ 246	$ 246	$ 246	$ 246	$ -	$ 2,194
Administrative Assistant	K USD	$ 66	$ 88	$ 88	$ 88	$ 88	$ 88	$ 88	$ 88	$ 88	$ -	$ 770
Administrative Superintendent / Controller	K USD	$ 145	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ -	$ 1,691
Accounts Receivable / Payable	K USD	$ 91	$ 121	$ 121	$ 121	$ 121	$ 121	$ 121	$ 121	$ 121	$ -	$ 1,063
Purchasing Agent	K USD	$ 110	$ 146	$ 146	$ 146	$ 146	$ 146	$ 146	$ 146	$ 146	$ -	$ 1,278
Janitor	K USD	$ 35	$ 71	$ 71	$ 71	$ 71	$ 71	$ 71	$ 71	$ 29	$ -	$ 559
Safety and Security Superintendent	K USD	$ 145	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ -	$ 1,691
Environmental Superintendent	K USD	$ 145	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ -	$ 1,691
Total Administration	K USD	$ 962	$ 1,252	$ 1,252	$ 1,252	$ 1,252	$ 1,252	$ 1,252	$ 1,252	$ 1,211	$ -	$ 10,937
Mining General Personnel												
Mine Superintendent	K USD	$ 194	$ 232	$ 232	$ 232	$ 232	$ 232	$ 232	$ 232	$ 97	$ -	$ 1,917
Mine Engineer	K USD	$ 107	$ 143	$ 143	$ 143	$ 143	$ 143	$ 143	$ 143	$ 60	$ -	$ 1,167
Surveyor	K USD	$ 159	$ 213	$ 213	$ 213	$ 213	$ 213	$ 213	$ 213	$ 89	$ -	$ 1,736
Chief Geologist	K USD	$ 135	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 75	$ -	$ 1,469
Ore Control Geologist	K USD	$ 101	$ 135	$ 135	$ 135	$ 135	$ 135	$ 135	$ 135	$ 56	$ -	$ 1,102
Samplers	K USD	$ 49	$ 297	$ 297	$ 297	$ 297	$ 297	$ 297	$ 297	$ 124	$ -	$ 2,250
Total Mine General	K USD	$ 746	$ 1,199	$ 1,199	$ 1,199	$ 1,199	$ 1,199	$ 1,199	$ 1,199	$ 500	$ -	$ 9,641
Mine Operations Hourly Personnel												
Operators												
Blasters	K USD	$ 78	$ 116	$ 116	$ 116	$ 116	$ 116	$ 116	$ 116	$ 49	$ -	$ 941
Blaster's Helpers	K USD	$ 73	$ 218	$ 218	$ 218	$ 218	$ 218	$ 218	$ 218	$ 82	$ -	$ 1,684
Drill Operators	K USD	$ 204	$ 891	$ 779	$ 1,447	$ 891	$ 891	$ 1,336	$ 1,373	$ 334	$ -	$ 8,145
Loader Operators	K USD	$ 204	$ 939	$ 816	$ 1,265	$ 980	$ 980	$ 1,143	$ 1,061	$ 367	$ -	$ 7,755
Haul Truck Operators	K USD	$ 594	$ 2,227	$ 2,486	$ 3,562	$ 3,562	$ 3,562	$ 3,934	$ 4,342	$ 1,447	$ -	$ 25,717
Total Operators	K USD	$ 1,152	$ 4,391	$ 4,417	$ 6,610	$ 5,767	$ 5,767	$ 6,747	$ 7,111	$ 2,279	$ -	$ 44,242
Mechanics												
Mechanics - Drilling	K USD	$ 81	$ 243	$ 212	$ 394	$ 243	$ 243	$ 364	$ 374	$ 91	$ -	$ 2,246
Mechanics - Loading	K USD	$ 81	$ 243	$ 233	$ 354	$ 243	$ 243	$ 283	$ 263	$ 91	$ -	$ 2,033
Mechanics - Haulage	K USD	$ 162	$ 607	$ 678	$ 971	$ 971	$ 971	$ 1,072	$ 1,183	$ 394	$ -	$ 7,010
Total Mechanics	K USD	$ 324	$ 1,092	$ 1,123	$ 1,720	$ 1,457	$ 1,457	$ 1,720	$ 1,821	$ 577	$ -	$ 11,288

16.9 MINE PIT DEWATERING

All mining is anticipated to be above the water table, so no dewatering wells will be required. Storm water that enters the pit will be handled using in-pit sumps as needed. Any excess water that does not naturally infiltrate into the ground will be placed in water trucks using a portable pump and subsequently used for dust control on haul roads.

17.0 PROCESSING AND RECOVERY METHODS

The Hasbrouck heap-leach project includes two separate facilities to be located 5 miles apart. Three Hills Mine will be constructed first, followed by the Hasbrouck Mine. Three Hills Mine will be a ROM heap-leach operation with carbon-column adsorption and support infrastructure facilities. Loaded carbon produced at Three Hills Mine will be processed offsite by "toll stripping". The Hasbrouck Mine will be a crushed ore, heap-leach operation with mining, a full recovery plant and associated infrastructure.

17.1 THREE HILLS PROPOSED MINE RECOVERY METHODS

17.1.1 THREE HILLS PROCESS DESCRIPTION SUMMARY

Three Hills Mine will be a 15,000 ton per day ROM heap-leach operation. Processing at Three Hills will be by conventional heap-leaching of ROM ore stacked on a single use pad. Gold will be leached from the mineralized material with dilute cyanide solution and recovered from the solution in a carbon adsorption circuit. Loaded carbon will be processed offsite by "toll stripping" where the carbon is stripped of metal in a desorption-recovery plant and returned for re-use along with the Doré product.

17.1.2 THREE HILLS PROCESS DESIGN CRITERIA

The criteria used for the design of the Three Hills heap-leach and ADR operation are summarized below in Table 17-1. Administrative and maintenance support will be provided on site. Laboratory support will be at a facility rented in the town of Tonopah. All process equipment has been sized for 5.475 million tons per year. Doré bars will be exported from the Three Hills property to a third party for refining and sale.

Table 17-1 Three Hills Process Design Criteria Summary

ITEM	DESIGN CRITERIA
Annual Ore Processing Rate	5.475 million tons– Design
Stacking Operation	12 hours/shift, 1 shift/day, 7 days/week, 365 days/year
Leaching Operation	12 hours/shift, 2 shifts/day, 7 days/week, 365 days/yr.
Average Production Rate	15,000 ton/day
Life of Mine	2 Years
Crushing	None - ROM
Average Gold Grade	0.018 oz Au/ton
Gold Recovery	79.0%
Primary Heap-leaching Cycle	114 days
Secondary Heap-leaching Cycle	57 days

While the design criteria shows 79% recovery, the refined equations provided by Mr. Jorgensen result in an 83% LOM recovery for Three Hills.

17.1.3 THREE HILLS LIME STORAGE AND ADDITION

Pebble lime will be required for pH control in the heap-leach and will have a nominal consumption of 4.0 lb/ton of ore. Lime will be stored in a 110 ton silo (4 days capacity) equipped with a variable speed feeder, which meters the lime directly into the loaded haul trucks for delivery to the heap-leach pad. Lime will be added in proportion to the tonnage of ore being hauled.

17.1.4 THREE HILLS STACKING

The ore at Three Hills will be processed in a truck-stacked ROM heap-leach. Ore from the mine will be loaded into haul trucks, mixed with lime for pH control as described above, and delivered to the HLF where it will be placed in 30ft lifts by the haul trucks. A dozer will be used to periodically assist the trucks in heap construction and rip the heap surface prior to the start of leaching.

17.1.5 THREE HILLS SOLUTION APPLICATION AND LEACHING

The ore will be leached using a dilute solution of sodium cyanide applied by a system of drip emitters. Leach solutions will be applied to the crushed ore heap at a nominal application rate of 0.0025 gpm/ft^2. Drip emitters will be used as they generate less evaporation than sprays and will minimize the make-up water requirement.

The dilute cyanide leach solution will percolate through the stacked ore, dissolve gold and drain by gravity to a pregnant solution tank, which will store the solution prior to further processing.

Vertical turbine pumps in the pregnant solution tank will pump solution to the head tank of the carbon columns. The solution will flow by gravity, through the carbon in columns, to a barren solution tank.

High-strength cyanide solution and antiscalant will be added to the barren tank by metering pumps. The barren solution will be pumped to the heap-leach pad using a vertical turbine pump. In-line strainers will be installed on the barren solution header to minimize the plugging of sprays by fine particulates. If desired, or if the grade of the pregnant solution collected from the heap is not at the desired level, the pregnant solution coming from the heap can be transferred to the barren solution tank instead of to the pregnant solution tank via valves and piping. Pregnant solution transferred this way will bypass the adsorption plant and be returned to the heap where it will increase in grade and so reduce the volume of pregnant solution treated in the adsorption plant.

17.1.6 THREE HILLS LEACH-PAD DESIGN AND SOLUTION COLLECTION

17.1.6.1 THREE HILLS BASIC DESIGN

The HLF will be a multiple-lift, single-use type leach pad designed to accommodate 10 million tons of ROM ore. The HLF has been designed with a lining system in accordance with International Cyanide Code requirements. These requirements meet or exceed North American standards and practices for lining systems, piping systems, and process ponds, which are intended to lessen the environmental risk of the facilities impacting local soils, surface water, and ground water, in and around the site.

The HLF has been sized using an average stacked material density of 97 lb/ft^3 and a maximum heap height of 150ft. ROM material will be truck-stacked at an average rate of 13,223 tons per day, 365 days per year. Material will be stacked in lifts varying in height from 20 to 30ft. Benches provided between lifts will create an average overall slope of 3:1 (horizontal to vertical), which provides operational and post-closure stability of the heap, and minimizes grading during reclamation.

The HLF will be lined with a composite lining system consisting of a prepared subgrade, a layer of 12in thick compacted low-permeability soil layer or geosynthetic clay liner ("GCL"), and an 80mil HDPE geomembrane liner.

The HLF will be constructed in a single phase providing a total lined leach-pad surface area of 3 million square feet. The construction of the leach pad will include the perimeter access road, pad geomembrane lining system, solution collection system, and permanent and temporary storm water diversion facilities. Solutions collected from the HLF will drain by gravity to either the barren or pregnant tanks located within the geomembrane-lined event pond.

17.1.6.2 THREE HILLS MINE HEAP LEACH FACILITIES GEOTECHNICAL

A geotechnical investigation was completed at the Three Hills Mine site in September 2014 in support of the design activities. During this investigation, three boreholes and three test pits were excavated within the footprint of the proposed HLF. Logs of the subsurface conditions were created, and samples of subsurface materials were collected and tested in the laboratory.

Surface topography at the Three Hills HLF site slopes gently to the northwest with a low relief valley that runs through the center of the proposed leach pad. The valley was dry at the time of the investigation, and appears to host water only at times of high precipitation. Sage brush and native grasses were present throughout the surface of the site.

The Three Hills HLF site is characterized with a shallow bedrock surface that is overlain by granular soils typically less than 8 feet thick and described as silty and clayey sand. The soils appear to be a reworked form of the volcanic tuff encountered elsewhere at the site, possibly transported and deposited by alluvial means. Roots were present from the surface to a depth of about 2 feet.

Bedrock was a rhyolitic volcanic tuff described as weak to extremely weak rock, slightly to moderately weathered, and relatively un-fractured. Often a residual bedrock veneer, up to 2 feet thick, was present at the top of bedrock surface. When highly weathered or pulverized, the bedrock exhibited low plasticity. The tuff was relatively homogeneous through the depth of the borings with localized highly weathered and extremely weak zones. Bedrock adjacent to the slope of Three Hills was welded, locally silicified and marginally rippable, while rock encountered within the footprint of the leach pad was not silicified and considered rippable with a D-9 to D-8 sized dozer.

Slope stability analysis for the Three Hills HLF was performed for both static and seismic conditions. A representative cross section was analyzed for the slope stability analysis. The section represented an ultimate heap height of 150ft with ROM ore placed in 30ft lifts at the angle of repose (approximately 1.4H:1V), and subsequent lifts setback to maintain an overall slope of 3H:1V. The critical section selected for analysis is located on the northern end of the HLF, adjacent to the event pond. At this location the base grade slopes toward the facility toe and the HLF is at its maximum height. The modeled liner system consisted of a GCL under a HDPE geomembrane.

The analysis for static conditions indicate factors of safety for both circular and block failure modes of 1.9 and 1.3, respectively. The results for the pseudo-static conditions during operations indicate factors of safety for both circular and block failure modes of 1.6 and 1.0, respectively. The results for the pseudo-static conditions during closure indicate factors of safety for both circular and block failure modes as 1.3 and 0.8, respectively. The results indicate that the slopes will remain stable throughout the lifetime of the facility for static conditions and the operating basis earthquake (475 year return event). In the event of an extreme seismic event (2,475 year return event), slope movement up to 24in may occur, which may result in minor sloughing but would not compromise the integrity of the slope.

Groundwater was not encountered during the field investigation and it is not anticipated to influence the design, construction or operation of the Three Hills HLF.

17.1.7 THREE HILLS SOLUTION STORAGE

17.1.7.1 THREE HILLS EVENT POND

The event pond will have a total storage capacity of approximately 7.5 million gallons. The capacity is based on the runoff from the estimated 100-year, 24-hour storm event and anticipated drain-down resulting from a 12-hour power outage, plus 110% of the capacity of the largest tank within the containment area of the pond. Excess solution would consist of a mixture of process solutions and storm water collected by the leach pad.

The event pond lining system will consist of two layers of HDPE geomembrane liner sandwiching a geonet layer to provide dual containment with leak detection. This lining system will be installed over a soil bedding layer. The pond bottom will slope towards a sump where solutions collected in the event pond will be pumped back to the process.

17.1.7.2 THREE HILLS PREGNANT AND BARREN SOLUTION TANKS

Leach solution draining from the heap to the pregnant and barren solution tanks will be monitored during operation with higher grade solution being routed to the pregnant solution tank and the remaining solution being routed to the barren tank. The pregnant solution tank is sized with sufficient capacity to operate for 30 minutes at the nominal primary leach rate of 3,000 gpm, which equates to 90,000 gallons of capacity.

The barren solution tank is sized to store fluids for 30 minutes of operation at the nominal secondary leach rate of 1,500 gpm plus the 3,000 gpm barren solution flow from the open-top carbon columns. This equates to a tank size of 135,000 gallons. Solution in the barren solution tank will be pumped to the active leach areas of the heap.

In the event of power outage or equipment malfunction, or if flows from the HLF exceed the storage capacity of the solution tanks and associated pumps, solution will flow into the event pond to maintain containment.

17.1.8 THREE HILLS SOLUTION MANAGEMENT

The Three Hills process system is designed as a zero discharge facility. Based on weather data and the HLF water balance, the project will operate in a monthly water deficit under all weather conditions; cyanide neutralization will not be required.

Several methods of solution management will be employed at the HLF to maintain adequate solution storage within the process tanks and event pond, and to reduce the need for make-up water and water treatment. The following elements have been incorporated into the design:

- Large event pond for solution storage during storm events and upset conditions;
- Drip irrigation emitters on the heap;
- Barren solution tank; and
- Pregnant solution tank.

The event pond will remain substantially empty and will not have seasonal accumulation under normal operating conditions. Solution collected in the event pond during storm events will be returned to the leach system as makeup solution as soon as practical. Solution in the pregnant and barren tanks will be maintained at the mid- to lower-range of their working capacities. Solution overflowing from either tank will be directed to the event pond.

17.1.9 THREE HILLS PROCESS WATER BALANCE

Ecological Resource Consultants, Inc. ("ERC") completed a water balance for the heap-leach facility at Three Hills Mine. The evaluation included development of a stochastic water balance that accounts for inflows such as rain and make-up water, outflows such as evaporation, and consumptive loss due to ore wetting.

To estimate inflow and outflow water requirements, the following criteria were considered:

- Total lined leach-pad area.
- Solution application flow rate and area.
- Heap-leach facility capacity.
- Climactic conditions and the 100-year, 24-hour storm event for the site, based upon data derived from local weather stations.
- Runoff coefficients for actively leached area, non-active leached area, side slopes and exposed liner.
- Make-up water volume will be available, if required.
- Average as-mined moisture content and specific moisture retention of the ore.
- Nominal solution application rate of 0.0025 gpm/ft^2.
- Maximum solution application rate of 0.0040 gpm/ft^2.
- Nominal side slope solution application rate of 0.00125 gpm/ft^2.
- Nominal solution flow rate is 4,500 gpm.
- Nominal 1,800,000 square feet of the top of the heap under leach.
- Minimum 1,125,000 square feet of the top of the heap under leach.

17.1.9.1 THREE HILLS PROCESS SOLUTION AND MAKEUP WATER

Losses are expected to exceed meteorological inputs. Make-up water is expected to be required during all months in all reviewed conditions. The make-up water requirement calculated by the ERC water balance does not include water needed for dust suppression or construction. The heap-leach facility make-up water rates are anticipated to range from approximately 170 gpm at the beginning of operations to nearly 450 gpm during the second summer when evaporation losses are greatest, assuming average precipitation conditions. The anticipated make-up water requirements are presented in Figure 17-1.

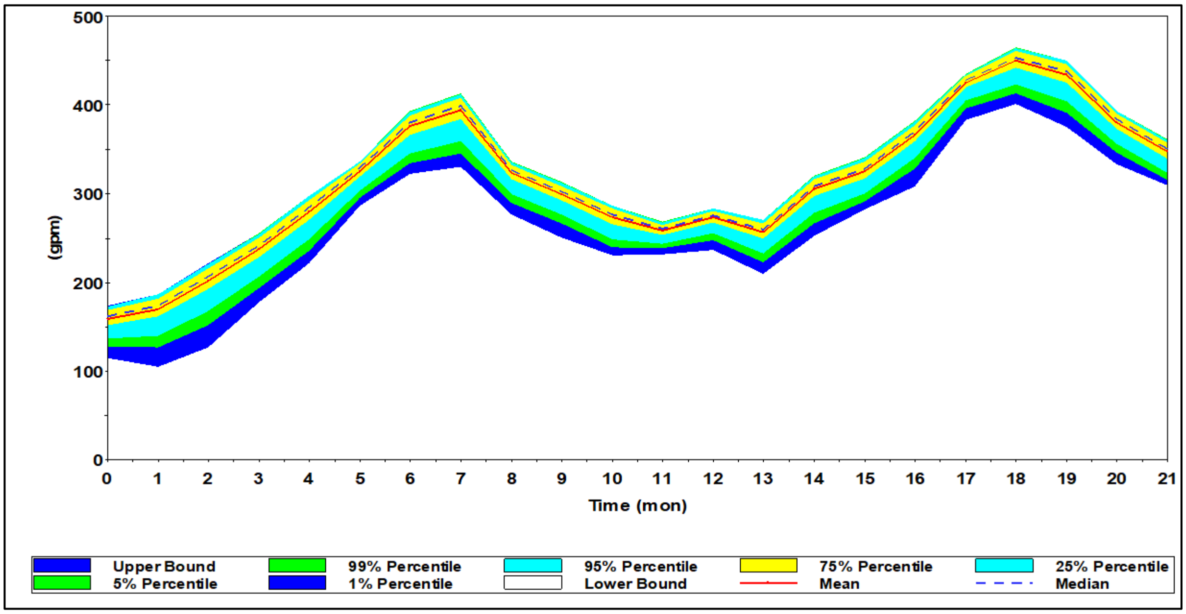

Figure 17-1. Heap-Leach Make-up Water Requirement

17.1.9.2 THREE HILLS PRECIPITATION DATA

Estimates of monthly precipitation at Three Hills were developed based on a review of regional data published by the Western Regional Climate Center. Monthly and annual precipitation statistics used in the water balance model, including standard deviations and correlation coefficients are summarized in Table 17-2.

Table 17-2 Mean Modeled Monthly Precipitation

Month	Mean Precipitation (in)	Standard Deviation (in)	Correlation Coefficient
January	0.37	0.36	0.129
February	0.44	0.5	0.013
March	0.49	0.55	0.073
April	0.45	0.48	0.418
May	0.47	0.55	-0.027
June	0.26	0.4	0.145
July	0.47	0.53	-0.086
August	0.5	0.63	0.001
September	0.39	0.51	-0.093
October	0.43	0.48	-0.036
November	0.37	0.52	0.145
December	0.31	0.3	0.113
Annual	4.92	1.96	

17.1.9.3 THREE HILLS WATER BALANCES

ERC completed a comprehensive water balance using the software GoldSim (version 9.60) which is a stochastic modeling tool that can be used to model a range of potential outcomes. A Monte Carlo Simulation model was developed using a monthly timestep for a period of 22 months, which is considered the operational period for the facility.

The water balance, in essence, tracks the inputs (process water and precipitation) and outputs (evaporation and ore uptake) through the system over time. Initially, process water added to fresh ore is absorbed (uptake) to increase the gravimetric moisture content ("MC") from the natural MC of 3 percent to the under-leach MC of 13 percent. Process water will be added to the heap at an average rate of 0.0025 gpm/ft^2. At the end of a leach cycle, interstitial free water will drain from the heap until a MC of 9.7 percent is achieved.

A heap loading rate of 15,000 tons per day was used in the water balance. This information was used to calculate drain-down timing related to various heap heights and storm runoff from the different surface areas (heap top, heap slopes and exposed geomembrane).

The water balance was conducted using both deterministic (average precipitation) and stochastic methods. Both methods use a set of fixed variables, but the deterministic method uses average precipitation data, whereas the stochastic method uses statistics to vary the precipitation to capture maximum and minimum precipitation cycles.

17.1.10 THREE HILLS ADSORPTION & RECOVERY

17.1.10.1 THREE HILLS ADSORPTION

The adsorption facility at Three Hills will consist of a single train of 5 up-flow, open-top CICs. The columns are capable of holding six tons of carbon each, thus providing a CIC process inventory of 30 tons of carbon.

Pregnant solution will be pumped to the carbon adsorption feed tank of the CICs at a nominal flow rate of 3,000 gpm. A magnetic flow meter and a wire sampler will be installed on the feed to the CICs to allow the calculation of total gold ounces fed to the carbon columns.

Pregnant solution will flow by gravity through the set of 5 columns in series, exiting the lowest adsorption column as barren solution. Barren solution from the fifth, lowest, carbon column will be continuously sampled by a wire sampler for metallurgical accounting, then discharged to the carbon safety screen to recover any floating carbon particles.

Underflow from the safety screen will flow by gravity to the barren solution tank. Any carbon recovered on the safety screen will be collected into a carbon super-sack for reuse.

The adsorption columns will operate in this fashion until the carbon contained in the first, upper, column achieves the desired precious-metal loading or the barren solution grade increases to an unacceptably high level. Loaded carbon from the first carbon adsorption column will then be pumped to the acid wash vessel. Carbon in each of the lower adsorption columns will be sequentially moved up the adsorption train, counter-current to the solution flow. This will continue from the fifth carbon column to the second carbon column. Once carbon has been advanced through the carbon columns, new or barren, regenerated carbon will be pumped into the fifth column.

17.1.10.2 THREE HILLS CARBON HANDLING

Carbon that is loaded with gold will be transferred by truck to a toll-stripping facility for further processing, as described in Section 17.1.10.3. Based on carbon loading of 150 oz/ton, Three Hills Mine is expected to produce approximately 40 tons of loaded carbon per month.

17.1.10.3 TOLL-STRIPPING OF CARBON

"Toll Stripping" is a process wherein carbon is sent to an off-site desorption and recovery plant where the gold-loaded carbon is stripped for a fee, a Doré is produced and barren carbon is regenerated and returned for re-use at the mine. It is assumed that returned carbon from the toll stripper can be used three additional times before carbon activity levels will no longer be suitable for carbon adsorption and must be replaced.

17.1.11 THREE HILLS PROCESS REAGENTS DELIVERY, STORAGE AND CONSUMPTION ESTIMATES

Process reagents will be stored in a fenced area under a steel roof structure.

Average estimated annual consumption of reagents based on design rates and reagent storage capacities are shown in Table 17-3.

Table 17-3 Three Hills Projected Annual Reagent Consumption and Storage

Reagent	Form	Storage Capacity	Annual Consumption
Pebble Lime	Bulk	110 tons	10,950 tons
Sodium Cyanide (30%)	Liquid Bulk Delivery	12.3 tons (solid) 40.9 tons (liquid)	1,232 tons (solid)
Activated Carbon	1,100 lb. super sacks	36 tons	132 tons
Antiscalant	240 gal liquid Tote Bins	8 totes (1,920 gal)	23,400 gal

17.1.11.1 THREE HILLS PEBBLE LIME

Pebble lime will be used to treat the ore prior to leaching. Lime maintains an alkaline pH during leaching. Lime will be delivered in tanker trucks which will be off-loaded pneumatically into a silo. A variable speed feeder on the bottom of the silo will dispense pebble lime onto the ore being carried by haul trucks to the heap leach, and is added in proportion to the tonnage of ore in each truck.

17.1.11.2 THREE HILLS SODIUM CYANIDE (NACN)

NaCN will be used in the leaching and, potentially, the adsorption process. Dissolved cyanide forms stable complexes with gold and silver, allowing these metals to remain in solution for eventual recovery.

NaCN will be delivered in tanker trucks as a liquid at 30% concentration for storage in an 8,529 gallon steel tank. Storage capacity will be approximately equal to 3.6 days of NaCN usage.

17.1.11.3 THREE HILLS CARBON

Activated carbon will be used to adsorb precious metals from the leach solution in the adsorption columns. Make-up carbon is 6 x 12 mesh. Carbon will be delivered in 1,100 lb super sacks. New carbon will be added to the circuit to replace carbon fines and carbon with reduced activity from the stripping process. The new carbon requirement to replace fine carbon losses is projected at 54 lb/ton of carbon stripped plus carbon consumed by the toll stripping (approximately 10 tons per month).

17.1.11.4 THREE HILLS ANTISCALANT

Antiscalant agents are used to prevent the build-up of scale in the process solution and heap irrigation lines. Antiscalant agent is normally added to the process pump intakes, or directly into pipelines. Consumption will vary depending on the concentration of scale-forming species in the process stream. Delivery is in liquid form in 240 gallon tote bins.

Antiscalant is added directly from the supplier tote bins into the pregnant and barren pumping systems using variable speed, chemical-metering pumps. Antiscalant consumption is expected to be 64 gallons per day. The recommended minimum inventory is 2 tote bins.

17.2 HASBROUCK MINE RECOVERY METHODS

17.2.1 SUMMARY OF HASBROUCK MINE PROCESS DESCRIPTION

The Hasbrouck Mine will include a 17,500 ton per day heap-leach operation. Processing at Hasbrouck will be by conventional heap leaching of crushed ore stacked on a single use pad. Gold and silver will be leached with a dilute cyanide solution and recovered from the solution using a carbon ADR process to produce Doré bars.

17.2.2 HASBROUCK PROCESS DESIGN CRITERIA

The criteria used for the design of the Hasbrouck heap-leach operation are summarized below in Table 17-4.

Table 17-4 Hasbrouck Mine Process Design Criteria Summary

ITEM	DESIGN CRITERIA
Annual Ore Processing Rate	6.3 million tons
Crushing and Stacking Operation	12 hours/shift, 2 shift/day, 7 days/week
Crushing Equipment Availability	75%
Nominal Stacking Rate	17,500 ton/day
Leaching Operation	12 hours/shift, 2 shift/day, 7 days/week
Average Daily Production Rate	17,500 ton/day
Life of Mine	5.53 years
Average Gold grade	0.017 oz Au/ton
Average Silver Grade	0.301 oz Ag/ton
Upper Seibert Gold Recovery	59.0%
Lower Seibert Gold Recovery	75.6%
Average Gold Recovery	73.0%
Silver Recovery	11.0%
Heap-leaching Cycle	115 days

While the recoveries shown in the design criteria were used to develop the processing methods, the actual recoveries differed in the final study based on formulas provided by Mr. Jorgensen. The final recoveries for gold were 54.2% and 75.9% for Upper Seibert and Lower Seibert respectively.

17.2.3 HASBROUCK MINE ORE STOCKPILES

The Hasbrouck Mine will include two stockpiles: the ROM stockpile and the crushed ore stockpile. The ROM stockpile is sized to accommodate 70,000 tons of ore. The ROM ore will be re-handled from the ROM stockpile by a front-end loader to supplement the direct dump feed to the ROM feed bin for the primary crushing circuit.

The crushed ore stockpile is planned to have a live capacity of approximately 2,300 tons. The crushed ore will be pulled from the stockpile by 2 belt feeders to the fine ore reclaim conveyor in a tunnel below the stockpile. Each belt feeder will be able to feed crushed ore to the fine ore reclaim conveyor at an average rate of 730 dry tph. The reclaim conveyor will discharge to an overland conveyor system that will transport the crushed ore to the agglomeration area.

17.2.4 HASBROUCK MINE CRUSHING

ROM ore will be delivered, and direct dumped to the greatest extent possible, by haul trucks from the mine to a primary crusher's dump hopper. Haul trucks will deliver ore to the ROM stockpile either for blending or when the dump hopper is full or inaccessible due to other traffic. A front-end loader will deliver ore from the ROM stockpile to the dump hopper either for blending or to supplement haul truck availability.

A stationary, 20in grizzly will be positioned above the dump hopper to prevent oversized ore from entering or obstructing the feeder. A rock breaker will be installed to break up oversized ore retained on the stationary grizzly. ROM ore will be delivered at an average rate of 730 dry tons per hour to a vibrating grizzly with a spacing of 6in. Oversized ore from the vibrating grizzly will be crushed in a primary jaw crusher.

The primary jaw crusher will crush oversize from the vibrating grizzly to 100% passing 12in. The discharge from the jaw crusher will combine with the vibrating grizzly undersize onto a primary crusher discharge conveyor, which will feed the secondary screen-feed splitter.

The secondary screen-feed splitter will use 2 secondary screen belt feeders to feed jaw crusher product to 2 parallel secondary screens. The secondary screens will scalp ore that is greater than 2in. This +2in, oversized ore will be recombined and sent to a cone crusher feed splitter box where 2 belt feeders will choke feed the secondary cone crushers. Output from the secondary cone crushers and the screen undersize will combine on a conveyor belt feeding the HPGR feed bin.

The HPGR feed bin will have a storage capacity of 950 tons. A belt feeder will meter the cone crusher product onto the HPGR feed conveyor. The HPGR feed conveyor will have a variable frequency drive to ensure the HPGR is choke fed. The HPGR product will discharge onto the HPGR discharge conveyor. An adjustable edge splitter at the transfer point from the HPGR discharge conveyor will cut approximately 7.5% of the HPGR discharge ore from each side of the belt to recycle it back to the HPGR, for a total recycle of 15% of the HPGR product. The center ore from the edge splitter chute will go to the fine ore stacker and onto a fine ore stockpile. Due to the high quantity of fines produced by the HPGR, a foaming dust suppression system and an extendible chute at the discharge of the fine ore stacker will be installed.

17.2.5 HASBROUCK MINE AGGLOMERATION

The crushed ore will be agglomerated with cement prior to cyanide leaching. The crushed ore will be conveyed from the crushed ore stockpile to the agglomeration area by an overland conveyor, which will discharge onto the pug mill feed conveyor. Cement will be added to the pug mill feed conveyor from a 100-ton silo with a screw feeder at a nominal rate of 5 lb per ton of crushed ore. The crushed ore and cement will then be fed to the pug mill for blending. Barren solution will be added in the pug mill to adjust the crushed ore's moisture content to between 7 and 13%. The pug mill will discharge onto the pug mill discharge conveyor, which in turn will discharge onto an overland conveyor, which feeds the stacking system. This overland conveyor will be adjusted as necessary to accommodate stacking.

The pug mill and all downstream conveyors will be located on lined areas for containment purposes. The liner will prevent the release of cyanide solution to the environment.

17.2.6 HASBROUCK MINE STACKING

The heap will be constructed using a conveyor stacking system. The conveyor stacking system will include the following components:

- An overland conveyor which will feed the mobile stacking system.
- Four "ramp" portable transfer conveyors, each 120ft long for conveying crushed ore up the heap for additional lifts.
- Nine "grasshopper" portable transfer conveyors, each 120ft long for conveying crushed ore across relatively flat areas.
- An 80ft long, horizontal, "Index Feed Conveyor" for transferring crushed ore from the grasshopper conveyors to a "Horizontal Feed Conveyor".
- A moveable, 125ft long, "Horizontal Index Conveyor" that will transfer crushed ore to a radial stacker.
- A 136ft long, telescoping, "Radial Stacking Conveyor" which will stack ore on the heap.

The grasshopper and ramp conveyors will transport the crushed ore from the overland conveyor on the heap to the stacking conveyors. The stacking conveyors will allow the radial stacker to place crushed ore in 30ft lifts with minimal downtime. The radial stacker and horizontal feed conveyor together will be capable of moving while slewing and stacking ore in an arc. The radial stacker will be able to retreat approximately the length of a grasshopper conveyor.

The system will be periodically stopped to add or remove grasshopper conveyors. The pad will be stacked from the down-slope toe in an up-slope direction for stability.

17.2.7 HASBROUCK MINE SOLUTION APPLICATION AND LEACHING

The ore will be leached using a dilute solution of sodium cyanide applied by a system of drip emitters, which will reduce evaporation and minimize make-up water requirements. Leach solution will be applied to the crushed ore heap at a nominal application rate of 0.0025 gpm/ft^2.

The dilute sodium cyanide leach solution will percolate through the ore on the heap, dissolving gold and silver, and drain by gravity to a pregnant solution tank, which will store the solution prior to further processing. Submersible pumps in the pregnant tank will pump solution to the head tank of the carbon columns. The solution will flow by gravity through the carbon in columns, and returning to a barren tank.

High-strength cyanide solution and antiscalant will be added to the barren tank by metering pumps. The barren solution will be pumped to the heap-leach pad by a vertical turbine pump. Strainers will be installed on the barren solution header tank to minimize the plugging of sprays by fine particles.

17.2.8 HASBROUCK MINE LEACH-PAD DESIGN

17.2.8.1 HASBROUCK MINE LEACH-PAD BASIC DESIGN

The Hasbrouck Mine HLF will be a multiple-lift, single-use type leach pad designed to accommodate 36 million tons of crushed ore, and will be constructed in two phases. The HLF has been designed with a lining system in accordance with International Cyanide Code requirements and meets or exceeds North American standards and practices for lining systems, piping systems, and process ponds. These standards and practices are intended to lessen the environmental risk of the facilities to impact the local soils, surface water, and ground water in and around the site.

The HLF has been sized using an average stacked ore density of 93.6lb/ft^3 and a maximum heap height of 150ft. Ore will be conveyor-stacked at a nominal rate of 17,500 tons per day. Ore will be stacked in 30ft lifts, and benches will be installed between lifts to create an average slope of 3:1 (horizontal to vertical), which provides operational and post-closure stability of the heap and minimizes grading at the time of reclamation.

The HLF will be continuously lined with a composite lining system consisting of a prepared subgrade, a 12in layer of compacted, low-permeability soil layer or GCL, and an 80mil HDPE geomembrane liner.

The HLF will be constructed in two phases providing a total lined leach-pad surface area of 8.5 million square feet. Phase 1 will consist of the northern portion of the leach-pad, perimeter access road, pad geomembrane lining system, solution collection system, permanent and temporary storm water diversion facilities, and the geomembrane-lined event pond. In Phase 2 the overland conveyor feeding the stacking system will be moved and the southern portion of the leach pad, pad geomembrane liner system, and solution collection system will be constructed.

17.2.9 HASBROUCK MINE HEAP LEACH FACILITIES GEOTECHNICAL

Geotechnical field investigations at the Hasbrouck HLF have not been performed at this stage of design; these are planned to be completed during the next phase of design activities. Surface and subsurface conditions within the footprint of the Hasbrouck Mine HLF were characterized by surface mapping conducted by Vista Gold Corporation during their ownership of the Hasbrouck Mine. Site topography includes a north-south trending mountain range on the eastern flank of the Hasbrouck site and a large, relatively flat valley approximately 6 miles wide lies to the west of the Hasbrouck site. Several broad alluvial drainages trend east to west from the north and south flanks of Hasbrouck Peak. Drainages are typically dry and host water only during times of high precipitation.

The proposed location of the HLF is 1 mile south of Hasbrouck Peak. Surficial alluvial deposits were mapped within the HLF footprint, with tuffaceous bedrock similar to the rock encountered at Three Hills mapped on low relief topographical highs in close proximity to the leach pad. Bedrock depth is anticipated to be shallow; however depth will be confirmed during future design activities.

Slope stability analysis for the Hasbrouck HLF was performed for both static and seismic conditions. A representative cross section was analyzed for the slope stability analysis. The section considered an ultimate heap height of 150ft with agglomerated ore placed in 30ft lifts at the angle of repose (approximately 1.4H:1V), and subsequent lifts setback to maintain an overall slope of 3H:1V. Base grades were modeled at a continuous 4.2% and sloped toward the facility toe. This is considered the most critical slope configuration, and is representative of the south-west portion of the HLF. The liner system will consist of a low-permeability under-liner soil placed beneath an HDPE geomembrane.

The analysis for static conditions indicated factors of safety for both circular and block failure modes of 1.9 and 1.6, respectively. The analysis of pseudo-static conditions during operations indicated factors of safety for both circular and block failure modes of 1.5 and 1.3, respectively. The analysis of pseudo-static conditions during closure indicated factors of safety for both circular and block failure modes of 1.2 and 1.1, respectively. The results indicated that slopes will remain stable throughout the lifetime of the facility for the operating basis earthquake (475 year return event), long term basis earthquake (2,475 year return event), and static conditions.

Groundwater is not anticipated to be present and was not considered an influence on the design, construction or operation of the Hasbrouck HLF.

17.2.10 HASBROUCK MINE SOLUTION STORAGE

17.2.10.1 HASBROUCK MINE EVENT POND

The Hasbrouck Mine process system will be a zero-discharge facility. The event pond will have a total storage capacity of 17.7 million gallons. This capacity is based on the runoff from the estimated 100-year, 24-hour storm event and anticipated drain-down resulting from a 12-hour power outage, and 110% of the capacity of the largest tank within the containment area draining into the event pond. Excess solution will consist of a mixture of process solutions and storm water collected by the leach-pad.

The event pond lining system will consist of two layers of HDPE geomembrane liner separated by a geonet layer to provide dual containment with leak detection. This lining system will be installed over a soil bedding layer. The pond bottom will slope towards a sump where solutions collected in the event pond will be pumped back to the process.

17.2.10.2 HASBROUCK MINE PREGNANT AND BARREN SOLUTION TANKS

Leach solution draining from the heap will be monitored during operations, with higher grade solution being routed to the pregnant solution tank and the remaining solution being routed to the barren tank. The pregnant solution tank will be sized with sufficient capacity for 30 minutes operation at the nominal, primary leach rate of 3,800 gpm, which equates to 114,000 gallons.

The barren solution tank will be sized to store 30 minutes of operation at the nominal leach rate of 3,800 gpm. This equates to a tank size of 114,000 gallons. Solution in the barren solution tank will be pumped to the active leach areas of the heap.

In the event of a power outage or equipment malfunction, or if excess flows from the HLF exceed the storage capacity of the solution tanks, solution will flow into the event pond to maintain containment.

17.2.11 HASBROUCK MINE SOLUTION MANAGEMENT

Several methods of solution management will be employed for the HLF to maintain adequate solution storage within the process tanks and event pond to reduce the need for make-up water and water treatment. The following elements have been incorporated into the design:

- Large event pond for solution storage after storm events and upset conditions.
- Drip irrigation emitters on the heap.
- Barren solution tank.
- Pregnant solution tank.

The event pond will remain substantially empty and will not have any seasonal accumulation under normal operating conditions. Solution collected in the event pond during storm events will be returned to the leach system as makeup solution as soon as practical. Solution in the pregnant and barren tanks should be maintained at the middle to lower range of their working capacities. Solution overflowing from either tank will drain by gravity to the event pond.

The Hasbrouck Mine is designed as a zero discharge facility. Based on weather data and the site water balance the project will operate in a water deficit under all weather conditions; cyanide neutralization will not be required.

17.2.12 HASBROUCK MINE PROCESS WATER BALANCE

KCA completed a water balance for the heap-leach facility at the Hasbrouck Mine. The evaluation included development of a water balance that accounts for inflows such as rain and make-up water, outflows such as evaporation, and consumptive loss due to wetting of ore.

To estimate inflow and outflow water requirements, the following criteria were considered:

- Total lined leach-pad area.
- Solution application flow rate and area.
- Heap-leach facility capacity.
- Climactic conditions for an average year, wet year and dry year.
- Make-up water volume: Solution will be applied by drip irrigation emitters.
- Average as-mined moisture content and specific moisture retention of the ore.
- Nominal solution application rate of 0.0025 gpm/ft^2.
- Nominal solution flow rate is 3,800 gpm.

17.2.12.1 HASBROUCK MINE PROCESS SOLUTION AND MAKEUP WATER

Process makeup water will be required for all months and for all precipitation conditions analyzed. Makeup water requirements are greatest between the months of May and August and are lowest during December and January. The HLF will require an average of 256 gal/h of makeup water for the process.

17.2.12.2 HASBROUCK MINE PRECIPITATION DATA

Estimates of monthly precipitation at the Hasbrouck Mine site were developed based on a review of regional data published by the Western Regional Climate Center.

17.2.12.3 HASBROUCK MINE WATER BALANCES

Based on the rainfall data, active water balances have been calculated for an average year, extreme wet year, and extreme dry year. The calculation tables are shown in Table 17-5, Table 17-6 and Table 17-7.

Based on the water balance there is no seasonal accumulation of solutions in the event pond and the project will always operate in a water deficit condition.

Table 17-5 Average Year Water Balance, Hasbrouck Mine

Active Leach Area	1,520,000
Lined Pad/Ditch Collection Area (sq. ft)	8,100,000
Lined Pond Collection Area (sq. ft)	120,000
Total Leach Flow to Heap (gpm)	3,800
Evaporation System Flow (gpm)	0
Allowable Wet Season Accum. in Process Ponds (ft^3)	2,250,000
Wet Season Ore Absorption (%)	6.7
Dry Season Ore Absorption (%)	6.7
Average Annual Emitter Evap (%)	2.0
Average Annual Sprinkler Evap (%)	0.0
Ore Throughput per Year (ton)	6,387,500

Assumptions

Pond evap. equals 60% of pan evap. over 50% pond area
Idle heap evapotranspiration equals 75% of pan evap.
Maximum evapotranspiration = rainfall over idle area

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Annual**
Days in Month	31	31	30	31	30	31	31	28	31	30	31	30	365
Precipitation (in)	0.47	0.50	0.39	0.43	0.37	0.31	0.37	0.44	0.49	0.45	0.47	0.26	4.95
Pan Evaporation (in)	17.71	15.66	11.17	6.79	2.94	0.00	0.00	3.84	7.26	10.09	13.64	16.09	105
Emitter Evap. (%)	4.0	3.6	2.5	1.5	0.7	0.0	0.0	0.9	1.7	2.3	3.1	3.7	2.0
Sprinkler Evap. (%)													
Idle Heap Evapotrans. Area (sq. ft)	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000
Idle Heap Evapotrans. (in)	13.3	11.7	8.4	5.1	2.2	0.0	0.0	2.9	5.4	7.6	10.2	12.1	79
Ore Placed on Pad (tons)	542,500	542,500	525,000	542,500	525,000	542,500	542,500	490,000	542,500	525,000	542,500	525,000	6,387,500
Precip. Collected (cu.ft)	321,950	342,500	267,150	294,550	253,450	212,350	253,450	301,400	335,650	308,250	321,950	178,100	3,390,750
Ore Absorption (cu. ft)	1,164,462	1,164,462	1,126,899	1,164,462	1,126,899	1,164,462	1,164,462	1,051,772	1,164,462	1,126,899	1,164,462	1,126,899	13,710,603
Emitter Evap. (cu. ft)	916,287	810,223	559,275	351,304	147,204	0	0	179,449	375,621	505,200	705,711	805,617	5,355,890
Sprinkler Evap. (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evapotrans. (cu. ft)	257,717	274,167	213,850	235,783	202,883	0	0	241,267	268,683	246,750	257,717	142,567	2,341,383
Pond Evaporation (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporation System (cu. ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Net Precip. Gain(+)/Loss(-) (cu. ft)	(2,016,516)	(1,906,352)	(1,632,874)	(1,456,999)	(1,223,536)	(952,112)	(911,012)	(1,171,088)	(1,473,116)	(1,570,599)	(1,805,940)	(1,896,982)	(18,017,127)
Excess Solution Pond													
Allowable Accum. in Excess 0	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	
Accum. into Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled from Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Quantity in Excess	0	0	0	0	0	0	0	0	0	0	0	0	
Makeup Solution Required (cu. ft)	2,016,516	1,906,352	1,632,874	1,456,999	1,223,536	952,112	911,012	1,171,088	1,473,116	1,570,599	1,805,940	1,896,982	18,017,127
Solution to Treat/Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 17-6 Extreme Wet Year Water Balance, Hasbrouck Mine

Active Leach Area	1,520,000
Lined Pad/Ditch Collection Area (sq. ft)	8,100,000
Lined Pond Collection Area (sq. ft)	120,000
Total Leach Flow to Heap (gpm)	3,800
Evaporation System Flow (gpm)	0
Allowable Wet Season Accum. in Process Ponds (ft^3)	2,250,000
Wet Season Ore Absorption (%)	6.7
Dry Season Ore Absorption (%)	6.7
Average Annual Emitter Evap (%)	2.0
Average Annual Sprinkler Evap (%)	0.0
Ore Throughput per Year (ton)	6,387,500

Assumptions

Pond evap. equals 60% of pan evap. over 50% pond area
Idle heap evapotranspiration equals 75% of pan evap.
Maximum evapotranspiration = rainfall over idle area

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Annual**
Days in Month	31	31	30	31	30	31	31	28	31	30	31	30	365
Precipitation (in)	0.45	0.43	1.05	0.95	1.70	0.65	0.45	1.00	2.13	1.50	0.26	0.00	10.57
Pan Evaporation (in)	17.71	15.66	11.17	6.79	2.94	0.00	0.00	3.84	7.26	10.09	13.64	16.09	105
Emitter Evap. (%)	4.0	3.6	2.5	1.5	0.7	0.0	0.0	0.9	1.7	2.3	3.1	3.7	2.0
Sprinkler Evap. (%)													
Idle Heap Evapotrans. Area (sq. ft)	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000
Idle Heap Evapotrans. (in)	13.3	11.7	8.4	5.1	2.2	0.0	0.0	2.9	5.4	7.6	10.2	12.1	79
Ore Placed on Pad (tons)	542,500	542,500	525,000	542,500	525,000	542,500	542,500	490,000	542,500	525,000	542,500	525,000	6,387,500
Precip. Collected (cu.ft)	308,250	294,550	719,250	650,750	1,164,500	445,250	308,250	685,000	1,455,625	1,027,500	178,100	0	7,237,025
Ore Absorption (cu. ft)	1,164,462	1,164,462	1,126,899	1,164,462	1,126,899	1,164,462	1,164,462	1,051,772	1,164,462	1,126,899	1,164,462	1,126,899	13,710,603
Emitter Evap. (cu. ft)	916,287	810,223	559,275	351,304	147,204	0	0	179,449	375,621	505,200	705,711	805,617	5,355,890
Sprinkler Evap. (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evapotrans. (cu. ft)	246,750	235,783	575,750	520,917	932,167	0	0	548,333	1,165,208	822,500	142,567	0	5,189,975
Pond Evaporation (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporation System (cu. ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Net Precip. Gain(+)/Loss(-)	(2,019,249)	(1,915,919)	(1,542,674)	(1,385,932)	(1,041,770)	(719,212)	(856,212)	(1,094,554)	(1,249,666)	(1,427,099)	(1,834,640)	(1,932,516)	(17,019,443)
Excess Solution Pond													
Allowable Accum. in Excess 0	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	
Accum. into Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled from Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Quantity in Excess	0	0	0	0	0	0	0	0	0	0	0	0	
Makeup Solution Required	2,019,249	1,915,919	1,542,674	1,385,932	1,041,770	719,212	856,212	1,094,554	1,249,666	1,427,099	1,834,640	1,932,516	17,019,443
Solution to Treat/Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 17-7 Extreme Dry Year Water Balance, Hasbrouck Mine

Active Leach Area	1,520,000
Lined Pad/Ditch Collection Area (sq. ft)	8,100,000
Lined Pond Collection Area (sq. ft)	120,000
Total Leach Flow to Heap (gpm)	3,800
Evaporation System Flow (gpm)	0
Allowable Wet Season Accum. in Process Ponds (ft^3)	2,250,000
Wet Season Ore Absorption (%)	6.7
Dry Season Ore Absorption (%)	6.7
Average Annual Emitter Evap (%)	2.0
Average Annual Sprinkler Evap (%)	0.0
Ore Throughput per Year (ton)	6,387,500

Assumptions

Pond evap. equals 60% of pan evap. over 50% pond area
Idle heap evapotranspiration equals 75% of pan evap.
Maximum evapotranspiration = rainfall over idle area

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Annual**
Days in Month	31	31	30	31	30	31	31	28	31	30	31	30	365
Precipitation (in)	0.20	0.00	0.10	0.45	0.16	0.10	0.20	0.10	0.22	0.15	0.09	0.05	1.81
Pan Evaporation (in)	17.71	15.66	11.17	6.79	2.94	0.00	0.00	3.84	7.26	10.09	13.64	16.09	105
Emitter Evap. (%)	4.0	3.6	2.5	1.5	0.7	0.0	0.0	0.9	1.7	2.3	3.1	3.7	2.0
Sprinkler Evap. (%)													
Idle Heap Evapotrans. Area (sq. ft)	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000
Idle Heap Evapotrans. (in)	13.3	11.7	8.4	5.1	2.2	0.0	0.0	2.9	5.4	7.6	10.2	12.1	79
Ore Placed on Pad (tons)	542,500	542,500	525,000	542,500	525,000	542,500	542,500	490,000	542,500	525,000	542,500	525,000	6,387,500
Precip. Collected (cu.ft)	137,000	0	68,500	308,250	106,175	68,500	137,000	68,500	150,700	102,750	58,225	34,250	1,239,850
Ore Absorption (cu. ft)	1,164,462	1,164,462	1,126,899	1,164,462	1,126,899	1,164,462	1,164,462	1,051,772	1,164,462	1,126,899	1,164,462	1,126,899	13,710,603
Emitter Evap. (cu. ft)	916,287	810,223	559,275	351,304	147,204	0	0	179,449	375,621	505,200	705,711	805,617	5,355,890
Sprinkler Evap. (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evapotrans. (cu. ft)	109,667	0	54,833	246,750	84,992	0	0	54,833	120,633	82,250	46,608	27,417	827,983
Pond Evaporation (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporation System (cu. ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Net Precip. Gain(+)/Loss(-)	(2,053,416)	(1,974,685)	(1,672,507)	(1,454,266)	(1,252,920)	(1,095,962)	(1,027,462)	(1,217,554)	(1,510,016)	(1,611,599)	(1,858,557)	(1,925,682)	(18,654,627)
Excess Solution Pond													
Allowable Accum. in Excess 0	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	
Accum. into Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled from Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Quantity in Excess	0	0	0	0	0	0	0	0	0	0	0	0	
Makeup Solution Required	2,053,416	1,974,685	1,672,507	1,454,266	1,252,920	1,095,962	1,027,462	1,217,554	1,510,016	1,611,599	1,858,557	1,925,682	18,654,627
Solution to Treat/Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0

17.2.13 HASBROUCK MINE ADSORPTION

The adsorption facility at the Hasbrouck Mine will consist of a single train of 5 up-flow, open-top CICs. The columns will be capable of holding 7 tons of carbon each, providing a CIC process inventory of 35 tons of carbon.

Pregnant solution will be pumped to the carbon adsorption feed tank of the CICs at a nominal flow rate of 3,800 gpm. A magnetic flow meter and a wire sampler will be installed on the feed to the CICs to allow the calculation of total gold ounces fed to the carbon columns.

Pregnant solution will flow by gravity through the set of 5 columns, exiting the last, lowest, adsorption column as barren solution. Barren solution from the last carbon column will be continuously sampled by a wire sampler for metallurgical accounting, and then discharged to the carbon safety screen to recover any floating carbon particles.

Underflow from the safety screen will flow by gravity to the barren solution tank. Carbon recovered on the safety screen will be collected in a carbon super sack for reuse.

The adsorption columns will operate in this fashion until the carbon contained in the first, upper, column achieves the desired precious metal loading, or the barren solution grade increases to an unacceptably high level. Loaded carbon from the first carbon adsorption column will then be pumped to the acid wash circuit. Carbon in each of the lower adsorption columns will be sequentially moved up the adsorption train, counter-current to the solution flow. This will continue from carbon column 5 to carbon column 2. Once carbon has been advanced through the carbon columns, new or regenerated carbon will be pumped into column 5.

17.2.14 HASBROUCK MINE ACID WASHING

Loaded carbon from the adsorption circuit will be advanced to an acid wash vessel. In this vessel, hydrochloric acid will be circulated through the carbon to remove calcium carbonate scale before being moved to the desorption cycle. The acid wash vessel is a fiberglass reinforced plastic lined, carbon steel vessel designed to contain 3.0 tons of carbon.

A dilute hydrochloric acid solution will be prepared in the acid mix tank and circulated through the acid wash vessel using a circulation pump. The dilute acid solution overflows the acid wash vessel and returns by gravity to the acid mix tank. Circulation will continue for several hours while process operators monitor and add concentrated acid as needed to maintain the solution's pH at or near 2. After the carbonate scale is removed, and acid is no longer consumed, the circulating acidic solution will be neutralized with caustic and pumped to the adsorption carbon safety screen for disposal as barren solution make-up water.

17.2.15 HASBROUCK MINE DESORPTION

The carbon will be advanced to the elution vessel after acid washing. The elution vessel is designed to process up to three tons of carbon in a modified Zadra-type desorption cycle, typically requiring 12 to 16 hours per cycle. During this process, gold will be removed from the carbon with a hot caustic strip solution at a temperature of 275°F and a pressure of 70psig. The solution will be heated indirectly using a diesel-fired boiler and heat exchangers. The strip solution exiting the elution column will be cooled through a heat exchanger and from there flow to the recovery circuit where gold will be recovered from the pregnant eluent by electrowinning. Barren eluent leaving the recovery circuit will return to the barren eluent storage tank to be heated and circulated back through the elution vessel. The elution cycle continues until the gold grade of the pregnant and barren eluents are approximately the same, or the allowed strip time has elapsed.

Carbon will then be discharged from the elution vessel onto a dewatering screen within the carbon handling area. Pressure from the barren solution is used to push the carbon from the elution vessel on to the screen for dewatering and further carbon handling.

17.2.15.1 HASBROUCK MINE ELECTROWINNING

Pregnant eluent will flow to two electrowinning cells that will be operated in parallel. Stripped gold from the desorption cycle will be removed from the pregnant eluent by electro-plating onto stainless steel cathodes. Periodically, the stainless steel cathodes will be removed from the electrowinning cell and washed with a high pressure spray to remove the gold sludge. The resulting sludge will be filtered in a plate and frame type filter press. The filter cake will then be processed in an electric mercury retort to remove mercury from the sludge. The mercury will be recovered in a water trap collector and periodically drained from the trap into air-tight vessels and shipped off-site for disposal.

17.2.15.2 HASBROUCK MINE CARBON THERMAL REGENERATION

Carbon will be transferred as needed from the carbon storage tank to the kiln feed hopper to maintain constant feed to the carbon regeneration kiln. The kiln will be a diesel-fired device that reactivates carbon by heating it at 1,400˚F. Reactivation will remove organic compounds that foul activated carbon and which reduces the carbon's activity or capacity to adsorb gold. The kiln will be capable or treating 154 lb of carbon per hour.

17.2.15.3 HASBROUCK MINE REFINING AND SMELTING

After removal of the majority of mercury by retorting, the gold sludge will be treated in an electric induction smelting furnace. The gold sludge will be mixed with fluxes, typically a combination of borax, niter, soda ash and silica sand, and smelted. The soda ash and niter oxidize impurities and allow them to collect into the slag phase while the bullion settles to the bottom of the crucible. Fluorspar may also be used to modify the slag viscosity. The slag and impurities will be poured off into a slag mold and the molten bullion will then be poured into a series of cascading molds. Gas emissions from the furnace will be extracted with a blower and filtered in a baghouse (furnace dust collector) to remove particulates prior to discharge to the atmosphere.

The bullion, or Doré, will be quenched and cooled in a water bath. Doré bars will be cleaned of slag and loose metal particles, labeled and weighed. Doré will then be shipped to an off-site refiner for further processing and sale as fine gold.

Slag will be crushed and inspected to remove visible beads of bullion that can be immediately re-melted or recycled to the pour. The remaining slag will be re-smelted to settle and recover any unrecovered bullion. The resulting barren slag will be shipped offsite for disposal.

17.2.16 HASBROUCK MINE PROCESS REAGENTS

The Hasbrouck Mine site will include storage for NaCN, antiscalant, cement, carbon, sodium hydroxide ("NaOH"), hydrochloric acid ("HCl"), diesel fuel and fluxes (silica, borax, niter and soda ash). Estimated annual reagents consumption and storage capacities for Hasbrouck are shown in Table 17-8.

Table 17-8 Hasbrouck Mine Projected Annual Reagent Consumption

Reagent	Form	Storage Capacity	Annual Consumption
Cement	Bulk	100 tons	15,750 tons
Sodium Cyanide (30%)	Liquid Bulk Delivery Truck	12 tons (S) 40 tons (L)	2,400 tons (S)
Activated Carbon	1,100 lb Super sacks	22 tons	30 tons
Diesel (process only)	Liquid Bulk Delivery Truck	1,791 gal	134,000 gal
Antiscalant	240 gal Liquid Tote Bins	8 totes (1,920 gal)	23,400 gal
Hydrochloric Acid (32%)	240 gal Liquid Tote Bins	6 totes (1,440 gal)	44,000 gal
Sodium Hydroxide (50%)	Liquid Bulk Delivery Truck	4,887 gal	93 tons
Silica	Dry Solid Sacks	1 ton	4.1 tons
Borax	Dry Solid Sacks	2 tons	6.6 tons
Soda Ash	Dry Solid Sacks	1 ton	2.5 tons
Niter	Dry Solid Sacks	1 ton	3.3 tons

17.2.16.1 HASBROUCK MINE CEMENT

Dry Portland cement will be purchased in bulk truck loads and stored in a silo on site. A variable-speed screw feeder will meter dry cement onto the pug mill feed conveyor in proportion to the tonnage of ore to be agglomerated.

17.2.16.2 HASBROUCK MINE SODIUM CYANIDE

NaCN will be used in the leaching, elution and potentially in the adsorption processes. NaCN will be delivered in tanker trucks as a liquid at 30% concentration. NaCN will be stored in an 8,339 gallon, steel tank. Storage capacity will be equivalent to approximately 1.8 days of NaCN usage.

17.2.16.3 HASBROUCK MINE CARBON

Activated carbon will be used to adsorb gold and silver from the leach solution in the adsorption columns. Make-up carbon is 6 x 12 mesh. Carbon will be delivered in 1,100lb super sacks. New carbon will be added to the circuit after being attritioned in the carbon attritioning tank. New carbon required to replace fine carbon losses is projected at 54 lb per ton of carbon stripped.

17.2.16.4 HASBROUCK MINE ANTISCALANT

Antiscalant agents will be used to prevent the accumulation of scale in the process solution and heap irrigation lines. Antiscalant agents are normally added to the process pump intakes, or directly into pipelines, and consumption will vary depending on the concentration of scale-forming species in the process stream. Delivery will be in liquid form in 240 gallon tote bins.

The antiscalant will be fed from the supplier tote bins into the pregnant and barren pumping systems using variable-speed, chemical-metering pumps. On average, antiscalant consumption is expected to be about 65 gallons per day. The recommended minimum inventory is 2 tote bins.

17.2.16.5 HASBROUCK MINE SODIUM HYDROXIDE

Sodium hydroxide (NaOH or caustic solution) from the reagent area caustic mix/storage tank will be used for acid neutralization in the acid wash circuit as well as in the strip solution. Caustic solution will be delivered in tanker trucks as a liquid at 50% concentration. Caustic solution will be stored in a 4,887 gallon, steel tank and will be fed directly from the storage tank using a small metering pump.

17.2.16.6 HASBROUCK MINE HYDROCHLORIC ACID

HCl will be used in the acid wash section of the elution circuit. The acid washing process consists of circulating dilute acid solution through the bed of carbon to dissolve and remove scale from the carbon. Acid washing is performed every elution cycle. Hydrochloric acid (28-32% by weight) will be delivered in totes, each containing 240 gallons.

17.2.16.7 HASBROUCK MINE PROCESSING FLUXES

Various fluxes are used in the smelting process to remove impurities from bullion. The normal flux components are a mix of silica sand, borax, and sodium carbonate (soda ash). The flux mix composition can be variable and will be adjusted to meet the project smelting needs. Fluorspar and/or potassium nitrate (niter) are sometimes added to the mix. These fluxes will be delivered dry, in 50 lb or 100 lb bags. Average consumption of fluxes is estimated to be 1 lb flux per pound of electrowinning precipitate smelted.

18.0 PROJECT INFRASTRUCTURE

Project infrastructure for the proposed Three Hills and Hasbrouck mines is shown conceptually on the general arrangement maps in Figure 18-1, Figure 18-2, and Figure 18-3.

18.1 SITE FACILITIES

18.1.1 ACCESS AND SITE ROADS

Three Hills Mine will be accessed via Knapp Avenue to Paymaster Canyon. The Knapp Avenue route runs west from the town of Tonopah, initially on Knapp Avenue (existing blacktop), and then transitions onto Paymaster Canyon Road ("PMC") (existing gravel) at the county line. A site access road will be installed from the PMC road running parallel to the southwest edge of the HLF to the mine parking lot and security gate area. Knapp Avenue is in Nye County and is administered by Nye County. Paymaster Canyon Road is in Esmeralda County and is administered by Esmeralda County.

The Hasbrouck Mine will be accessed via a proposed access road from U.S. Highway 95. The access road will route traffic to the parking lot and security gate area.

Turnouts from Highway 95 to the Hasbrouck Mine access will be installed in consultation with and according to the requirements of the Nevada Department of Transportation.

Nye County and Esmeralda County commissions and the Town of Tonopah Board have been briefed on the project's plan for access and have concurred subject to entering an agreement for reimbursement for costs of maintenance and repair consequent to mine traffic.

Within each site, light vehicle roads will provide access from the security gate to other areas throughout the site, including the HLF, event pond, processing facilities, administrative areas and mining contractor yard. Material deliveries for lime, prill and explosives will primarily use the light vehicle access road but will cross haul roads at Three Hills Mine. Haul roads provide travel routes between the mine pit, waste rock storage area, mining contractor yard, and the Three Hills Mine HLF, or the Hasbrouck Mine crushing facility.

18.1.2 SECURITY AND FENCING

Both Three Hills and Hasbrouck mines will have a main security gate allowing controlled entry and exit from each property. These gates will be unmanned, but with call boxes and video surveillance monitored by staff in the warehouse or administration buildings. Visitors' and delivery vehicle entrance will be controlled by the warehouse or administration staff. Card readers will allow company and approved contractor and visitors entrance to the sites.

Fences will be constructed around the perimeter of both sites using 3 to 4 strands of barbed wire. The pits, waste rock storage areas, heap-leach facilities, haul roads, contractor yards and all other ancillary facilities will be secured areas with access controlled at the main security gates.

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Internal to the sites, wildlife fencing will be installed around the event pond and pregnant and barren solution tanks. Basic chain link fencing will be used around the warehouse yard and high security fencing will be used to isolate the ADR refinery area.

Figure 18-1 Three Hills Mine General Arrangement Map

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Figure 18-2 Hasbrouck Mine General Arrangement Map

Figure 18-3 Waterline Alignment Map, Three Hills and Hasbrouck

18.1.3 WATER SUPPLY

No potable water supply will be installed at Three Hills Mine as the intention is to locate administration and laboratory services in the town of Tonopah. Potable water for the Hasbrouck Mine will be sourced from the raw water delivered to the Hasbrouck Mine from Three Hills Mine. A potable water system will be installed at Hasbrouck Mine. Raw water piped to Hasbrouck Mine from wells at Three Hills Mine will be treated to meet potable standards.

Raw water is defined in this report as all water required for the project. It includes water for construction purposes, make-up water for mineral processing, water for dust control on mine roads and ore processing, and other sundry non-potable uses. Raw water is not required to meet potable water standards. The average rate of raw water that will be required at each mine is 500 gpm.

Make-up water for both mines is planned to be appropriated ground water from two wells installed at Three Hills Mine. WVM has leased certified water rights which permits WVM to appropriate ground water from the wells for use at both mines in the short term.

Preliminary analysis of the existing water rights and groundwater conditions indicate that these wells can meet the project's raw water requirements. The water supply wells will be located approximately 3,700ft north of the Three Hills Mine process facilities. A powerline and transformer will provide power to the water wells from the liquefied natural gas ("LNG") power generators. For the Hasbrouck Mine, the water will be piped from Three Hills Mine, a pipeline distance of approximately 33,000ft.

18.1.4 WATER DISTRIBUTION

At both mines HDPE pipelines will be used to convey water from the wells to 500,000-gallon water storage tanks. At Three Hills Mine, the water storage tank will be located adjacent to the process facilities. Due to the limited elevation difference between the tank and the facilities, pumps will be required to boost pressure and provide adequate flow. At the Hasbrouck Mine, the water storage tank will be located west of the pit, west of U.S. Highway 95. The elevation of the Hasbrouck tank will provide adequate pressure for the system and booster pumps will not be required.

The shortest route for the water pipeline from the water supply well to Three Hills Mine will require the consent of a landowner whose land it will cross. Should the landowner in question decline permission, a slightly longer route exclusively on WVM-owned property will be used.

The water pipeline route between the water supply well and the Hasbrouck Mine will be on public land. Approval for the well and pipeline installation has been obtained as part of the approval by BLM to construct the Hasbrouck Mine required under the National Environmental Protection Act.

18.1.5 FIRE WATER

The source of fire-fighting water for both the Three Hills and Hasbrouck mines will be the 500,000-gallon water storage tanks at each site. The water transmission systems supplying fire water at both mines will be designed to meet the pressure, flow and volume requirements of the fire codes based on the equipment and building types constructed at each mine. A fire suppression water system will be installed at each mine to provide service to the buildings and fire hydrants will be placed at regular intervals around the buildings. Based on the planned building sizing and construction type, the required fire-fighting water requirement is estimated at 1,500 gpm for 2 hours with a minimum pressure of 20psi. At the Three Hills Mine, to ensure the flow, volume, and pressure requirements of the fire-fighting source are met, diesel booster pumps will be installed on the fire water transmission pipeline. No pumps will be required at the Hasbrouck Mine. In addition, to the fire-fighting systems in place, an agreement will be entered into with the nearby Town of Tonopah Fire Department for fire-fighting services.

Fire extinguishers will be placed in buildings, in equipment storage yards, in vehicles, and in heavy equipment as required by MSHA. Light vehicles will carry a small water supply or a fire extinguisher to control fires generated by exhaust or catalytic converters. Fire extinguishers will be of the type required to address the reasonably anticipated class of fire at a given location. Fire extinguishers will be serviced regularly to ensure their proper functioning. Employees will be trained in the use of hand-held fire extinguishers and alarm systems. Locations and proper use of fire extinguishers will be reviewed with personnel on an annual basis, at a minimum, and upon assignment for new personnel.

18.1.6 FUEL HANDLING FACILITY

A fuel storage depot will be located at the contractor yard. It will include separate diesel aboveground tanks for fueling of light/intermediate and heavy vehicles. Gasoline will be obtained either from public filling stations in the Town of Tonopah, or from a tank in the fuel storage depot at the contractor yard. Spill containment will be designed for 110 percent of the largest tank or tanker within the containment. Fuel will be delivered via highway-legal trucks directly to the depot. Drivers off-loading fuel will be certified and trained. Cam-lock fittings or other appropriate fittings will be located within the containment to collect spilled fuels. A sump will be located a one end of the containment so that spilled fuels can be pumped from the containment, using a portable pump, for appropriate disposal.

18.1.7 FIRST AID AND EMERGENCY PREPAREDNESS

First aid kits will be maintained in the administration building, truck shop, laboratory, process building, warehouse, and safety/security building, in addition to vehicles and heavy equipment as required by MSHA. Personnel will be trained and certified in CPR and basic first aid on an annual basis.

In the event of an emergency on site, responding mine personnel will first contact external emergency services via two-way radios installed in vehicles and heavy equipment or by cell phone. Once the emergency has been stabilized, the Sheriff's Department and additional regulatory agencies will be contacted as required. Fire and medical emergencies will be responded to by emergency services located in Tonopah.

Fire response is within the jurisdictional boundaries of the BLM, Esmeralda County, and the Town of Tonopah; therefore, these three agencies will likely be the first external responders to an emergency. The closest major medical center to both mines is the Nye Regional Medical Centre in Tonopah, approximately 5 road miles from the Hasbrouck Mine and 2 road miles from Three Hills Mine. This has an emergency room and emergency medical personnel. If immediate care is necessary that cannot be provided at the Nye Regional Medical Center, the Med Air Ambulance program out of Las Vegas, Nevada is equipped to provide rapid air transportation of critically injured/ill persons.

Emergency contact information for site personnel, first responders, medical care, and local and federal agencies will be provided at each mine site.

18.1.8 COMMUNICATIONS

Both mine sites have good cellular telephone coverage. Voice and data communication at Three Hills Mine will be either via a cable or satellite, and at the Hasbrouck Mine via satellite.

On-site communications will be by cellular telephone and two-way radio. A separate radio frequency will be established for emergency use, and emergency response and communication protocols will be established.

18.1.9 TRANSPORTATION

Transportation of materials, equipment, and personnel to and from the mines will be by road-going vehicles. On-site transportation will be trucks of various types.

18.1.10 BUILDINGS

Buildings required for the Hasbrouck Project include administration, safety, mine operations, warehouse and laydown area, assay lab, process buildings, and ADR maintenance shop.

The administration building will be a double- or triple-wide office trailer with sufficient room for up to 8 offices and one conference room, as well as a first aid clinic. A second trailer of approximately the same size will be used for mine operations to house the mining supervision, engineering, and geology departments. A third trailer, about half of the size, will be used for safety and training facilities. Each of the buildings will be placed in service with electrical, water, and leach field sewage.

All three of these office trailers will be located at Three Hills Mine at the beginning of operations. It is envisioned that some or all of these buildings will be relocated to the Hasbrouck Mine once operations have transitioned away from Three Hills.

18.1.10.1 THREE HILLS PROCESS AREA BUILDINGS

The warehouse and laydown area and assay laboratory were evaluated by KCA.

Assay Lab: A full-service laboratory facility will be installed for use by both Three Hills and Hasbrouck mines. The laboratory building will be rented or purchased in Tonopah and will be fully equipped with all required laboratory and ventilation equipment. The laboratory will be divided into four areas for sample preparation, fire assay, metallurgical testing, and a wet laboratory area. The laboratory will also include office space and a restroom. The laboratory is to be sized to process 100 solid samples per day and 150 solution samples per day.

Process warehouse and workshop: The process shop and warehouse at Three Hills will be a 2,900 ft^2, pre-engineered, steel building and located near the CIC circuit. The process shop will have a main work area for repairs and maintenance, and also includes warehouse space for spare parts and necessary equipment. A bridge crane will span half the building to ease maintenance. There will be a fenced laydown area to store larger spare parts.

18.1.10.2 HASBROUCK PROCESS AREA BUILDINGS

The warehouse and laydown area and process buildings were evaluated by KCA.

Reagents Storage Building: The reagents storage building (pre-fabricated steel roof with fencing) will be 1500 ft^2. The facility will be divided into three sections with storage for carbon, hydrochloric acid, antiscalant, and other dry reagents such as fluxes.

ADR Plant and Refinery: The ADR plant will be housed in a multi-sectional, pre-engineered, steel building with the main ADR section approximately 145ft L x 42ft W x 44ft in eave height. An additional pre-engineered section approximately 14ft L x 25ft W x 20ft H for the caustic area will be attached to the ADR section. The refinery will be approximately 79.5ft L x 44.5ft W x 22.75ft H and will share a wall with the ADR building. The refinery will be constructed of concrete masonry unit ("CMU") walls with a lightweight concrete roof. The main section of the ADR facility will contain the regeneration kiln and carbon handling system, the acid wash and stripping vessel, the strip heating system, and an insulated holding tank. The secure refinery area will contain the electrowinning cells, mercury retort, flux mixing, slag granulation and the fuel-oil fired smelting furnace.

The refinery area will contain a safe which will be secured. The safe will be secured to the concrete structure of the refinery. A concrete slab measuring approximately 29ft L x 15.5ft W with a 10ft cyclone fence and lockable gates will be constructed adjacent to the refinery main door. This area will allow ores to move in and out of the refinery area without compromising security. Security cameras will be installed at strategic locations, connected to remote monitors and recorders.

A dual level office/facilities complex measuring approximately 29ft L x 29ft W x 22.5ft H will be adjacent to the refinery and ADR building. The building will contain a restroom and changing room facilities, a lunch/conference room, offices and a security area.

Process and Maintenance Warehouse: The process shop and warehouse at Hasbrouck will be a 3,430 ft^2, pre-engineered, steel building located near the ADR plant. The Hasbrouck process shop will have a main work area for repairs and maintenance, such as for equipment for the crushing plant and ADR plant, and includes an office area, tool room and warehouse space for spare parts and necessary equipment. There will be a fenced laydown area to store larger spare parts.

18.1.11 EXPLOSIVE STORAGE AND HANDLING

Explosives and blasting agents will be purchased, transported, handled, stored, and used in accordance with the Bureau of Alcohol, Tobacco, Firearms, and Explosives ("BATFE"), Department of Homeland Security ("DHS") provisions, and MSHA regulations. Blasting will be done using ANFO as the primary blasting agent. Boosters and blasting caps will be used to initiate the ANFO in each hole. Ammonium nitrate prill will be stored in a silo in a secure area and mixed with diesel to produce ANFO in specialized explosive trucks. These trucks will deliver the product to the active mining bench as required for blasting.

Conceptual locations are shown in Figure 18.1 and Figure 18.2.

18.2 ELECTRICAL POWER SUPPLY AND DISTRIBUTION

Electrical power for Three Hills will be provided by a rented liquefied natural gas (LNG) generator located on site. Electrical power for the Hasbrouck Mine will be grid power supplied by NV Energy, the local electrical distributor, which has provided preliminary designs and costs for offsite electrical distribution infrastructure. KCA has provided preliminary designs and costs for onsite electrical distribution at both mines.

18.2.1 OFFSITE ELECTRICAL POWER

Offsite electrical supply is defined as the infrastructure necessary to bring power to the fence of the mine substation at the Hasbrouck Mine.

Electrical power for Three Hills will be provided by a rented, reciprocating-piston engine generator powered by LNG as summarized in Section 18.2.2.

Preliminary design and costs for supplying electricity to the Hasbrouck Mine site have been provided by NV Energy and indicate the following:

- A 120 kV switching station ("Siebert switching station");
- Communications equipment;
- Relaying upgrades and communications additions as required at Millers and Sandia; and
- Metering at the mine site substation.

18.2.2 THREE HILLS MINE ONSITE ELECTRICAL POWER

A budget quote for renting this equipment from Aggreko, a world-leading generating equipment rental company, has been used in this study, and is based on a unit that Aggreko is currently renting to an analogous operation in Nevada. Aggreko's equipment consists of heavy-duty, spark-arrested, turbo-charged, after-cooled engines which have a purpose-built alternator and are suitable for continuous operation in harsh environments (Figure 18-4). This engine design and the use of LNG result in low emissions and little smoke in exhaust gases. Ancillary equipment consist of a trailer-mounted gasifier and a trailer-mounted LNG tank.

Figure 18-4. Example of LNG Powered Reciprocating Piston Engine Generator

At Three Hills mine site the estimated attached load for the water supply system, process plant including the reagents area and ancillary equipment will be 1.6MW, with an average draw of 0.7MW (Table 18-1).

Table 18-1 Three Hills Heap Leach and Process Facilities Power

Area	Attached Power kW	Peak Power kW	Average Power kW	kWh/year	kWh/ton Ore
Water Distribution	337	252	161	1,411,729	0.258
Heap-leach & Solution Handling	526	436	428	3,246,107	0.618
Adsorption	5	4	4	3,995	0.001
Reagents	4	3	3	8,069	0.002
Ancillaries	16.0	12	9	40,149	0.001
Total At Three Hills	*888*	*707*	*604*	*4,843,948*	*0.885*
Laboratory (located in Tonopah)	234	175	100	859,385	0.157
Total	1121	882	713	5,703,333	1.042

18.2.2.1 THREE HILLS BACKUP POWER

A 750kW, 480V diesel or LNG powered backup generator will be installed in the process area for emergency power for those parts of the processing system that need to run continuously, which include the process solution pumps to maintain solution circulation, certain items of small equipment within the plant, and plant lighting. A diesel or LNG fuel tank will provide a minimum of 24 hours of fuel necessary to fulfill the attached equipment power requirements.

18.2.2.2 THREE HILLS ONSITE ELECTRICAL DISTRIBUTION

Within the site, power will be routed to points of use at 4,160V via overhead power lines or at 480V. Where 4,160V is used, transformers will reduce the voltage to 480V to feed the MCC and distribution panels. The ancillary loads, i.e. lighting, instruments, etc. will be fed through small, dry-type transformers with a step down from 480V to a range of 220-127V.

The detailed engineering phase will finalize the design criteria required to construct the branch feeders onsite with respect to costs, safety, reliability, underground or overhead requirements, etc., in conformance with all applicable codes and standards.

18.2.3 HASBROUCK MINE ONSITE ELECTRICAL POWER

The estimated attached load for the water supply system, crushing system, conveying and stacking system, ADR plant including the reagents area, and ancillary equipment at the Hasbrouck Mine site is 6.5 MW, with an average draw of 4.1 MW. The estimated process-area electrical power consumption by project area is depicted in Table 18-2.

Table 18-2 Hasbrouck Power For Heap-Leach and Process Facilities

Area	Attached Power kW	Peak Power kW	Average Power kW	kWh/year	kWh/ton Ore
Water Supply & Distribution	491	369	270	1,742,817	0.322
Primary Crushing	409	284	218	1,623,149	0.301
Secondary & Tertiary Crushing	3,268	2,721	2,041	17,630,667	3.265
Conveying, Agglomeration & Stacking	1,246	1,126	845	7,298,804	1.352
Heap-leach & Solution Handling	533	404	396	1,971,363	0.365
Adsorption	5	4	4	9,390	0.002
Reagents	3	1	1	336	0.000
Ancillaries	30	26	17	71,280	0.013
Acid Wash & Elution	31	25	24	85,354	0.016
Carbon Handling & Regeneration	67	56	53	187,814	0.035
Electrowinning & Refining	215	164	160	690,429	0.128
Reagents	4	3	2	21,481	0.004
Ancillaries	194	145	73	313,470	0.058
Total at Hasbrouck	6496	5,328	4,104	31,646,353	5.860
Laboratory (Located in Tonopah)	234	175	113	847,612	0.157
Total	6,729	5,503	4,217	32,493,965	6.017

18.2.3.1 HASBROUCK ELECTRICAL SUBSTATION

The mine site substation will have a capacity of 8,000kV and will consist of a single transformer with a step down from 120kV to 4,160V. It will include all protective devices, switching, instrumentation, communications, relaying, and ancillaries according to the requirements of the mine and in conformance with codes, regulations, and NV Energy standards.

18.2.3.2 HASBROUCK BACKUP POWER

A 750kW, 480V diesel-powered backup generator will be installed in the process area for emergency power for those parts of the processing system that need to run continuously, which include the process solution pumps to maintain solution circulation, certain items of small equipment within the plant, and plant lighting. A diesel fuel tank will provide a minimum of 24 hours of fuel necessary to fulfill the attached equipment power requirements.

18.2.3.3 HASBROUCK ONSITE ELECTRICAL DISTRIBUTION

On-site electricity will be routed to equipment at 4,160V via overhead power lines. Transformers will reduce the voltage from 4,160V to 480V to feed the MCC(s) and distribution panels. Ancillary loads, i.e. lighting, instruments, etc. will be fed through small, dry-type transformers which will step down from 480V to a range of 220-127V.

The detailed engineering phase will finalize the design criteria required to construct the branch feeders onsite with respect to costs, safety, reliability, underground or overhead requirements, etc. and always in conformance with all applicable codes and standards.

19.0 MARKET STUDIES AND CONTRACTS

No market studies have been undertaken for this project. However, the commercial products from the Hasbrouck Project will be gold-silver Doré. Gold-silver Doré is readily sold on the global market to commercial smelters and refineries. It is reasonable to assume that Doré from the Hasbrouck Project will be salable.

To determine appropriate metal prices to be used for economic analysis and cut-off grades, RESPEC has considered spot and historical prices at the Effective Date of this report and reviewed current metal prices used in recent NI 43-101 Technical Reports. The primary selection for metal prices in this report has been made based on historical prices, which are in line with current consensus pricing found in other Technical Reports.

The previous 12-months (January 2021 through December 2022) metal prices are shown in Table 19-1 and Table 19-2 for gold and silver respectively. The current 3-year average gold price as of this writing is $1,791 and the 3-year silver price as of the end of December 2022 is $22.47 based on tracking of Kitco historical prices. While RESPEC used $1,750 per ounce gold and $21.50 per ounce silver for validating the previous pit designs, the PFS cash-flow model used the 3-year rolling average metal prices. These were rounded to $1,790 per ounce gold and $22.50 per ounce silver. RESPEC believes this is reasonable for the reporting of Hasbrouck Project Mineral Reserves.

Table 19-1 Kitco Monthly Gold Prices (USD/oz Au – December 2021 to November 2022)

Month / Yr	Average	High	Low	3-Yr Avg	1-Yr Avg
Jan-22	$ 1,817	$ 1,847	$ 1,788	$ 1,669	$ 1,795
Feb-22	$ 1,856	$ 1,936	$ 1,793	$ 1,684	$ 1,799
Mar-22	$ 1,948	$ 2,039	$ 1,910	$ 1,702	$ 1,819
Apr-22	$ 1,934	$ 1,977	$ 1,886	$ 1,720	$ 1,833
May-22	$ 1,848	$ 1,892	$ 1,810	$ 1,735	$ 1,832
Jun-22	$ 1,834	$ 1,853	$ 1,817	$ 1,748	$ 1,832
Jul-22	$ 1,736	$ 1,808	$ 1,701	$ 1,757	$ 1,827
Aug-22	$ 1,766	$ 1,797	$ 1,716	$ 1,765	$ 1,825
Sep-22	$ 1,683	$ 1,726	$ 1,634	$ 1,770	$ 1,817
Oct-22	$ 1,664	$ 1,715	$ 1,634	$ 1,774	$ 1,808
Nov-22	$ 1,726	$ 1,773	$ 1,629	$ 1,781	$ 1,800
Dec-22	$ 1,797	$ 1,824	$ 1,774	$ 1,790	$ 1,801

Table 19-2. Kitco Monthly Silver Prices (USD/oz Ag – January 2022 to December 2022)

Month / Yr	Average	High	Low	3-Yr Avg	1-Yr Avg
Jan-22	$ 23.13	$ 24.32	$ 22.24	$ 20.83	$ 24.93
Feb-22	$ 23.47	$ 25.32	$ 22.36	$ 21.04	$ 24.60
Mar-22	$ 25.24	$ 26.18	$ 24.63	$ 21.31	$ 24.57
Apr-22	$ 24.54	$ 25.92	$ 23.16	$ 21.58	$ 24.48
May-22	$ 21.90	$ 22.92	$ 20.84	$ 21.78	$ 24.02
Jun-22	$ 21.49	$ 22.26	$ 20.42	$ 21.96	$ 23.56
Jul-22	$ 19.08	$ 20.07	$ 18.27	$ 22.05	$ 23.00
Aug-22	$ 19.75	$ 20.60	$ 17.95	$ 22.13	$ 22.66
Sep-22	$ 18.84	$ 19.93	$ 17.77	$ 22.15	$ 22.28
Oct-22	$ 19.36	$ 20.93	$ 18.39	$ 22.20	$ 21.95
Nov-22	$ 21.00	$ 21.95	$ 18.92	$ 22.30	$ 21.69
Dec-22	$ 23.18	$ 23.95	$ 22.14	$ 22.47	$ 21.75

WVM's land obligations and contracts have been summarized in Section 4. There are no other contractual obligations related to the project.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIALS OR COMMUNITY IMPACT

Westland Engineering & Environmental Services, an environmental permitting and government relations consultant, provided the following section on environmental considerations, permitting, and social and community impacts. It has been taken from Tietz et al. (2016) with modifications for progress in permitting since the 2016 Hasbrouck gold-silver Project Pre-feasibility Study.

The Hasbrouck Project comprises Three Hills Mine and Hasbrouck Mine. WVM made the decision shortly after acquiring the properties in April 2014 to permit each mine separately in order to accelerate permitting Three Hills Mine, which due to its small area of disturbance and no significant environmental or social impacts was permitted under an Environmental Assessment.

WVM has undertaken community engagement through multiple meetings with the Tonopah Town Board, officials of Nye and Esmeralda counties, and local residents through open-house meetings at Goldfield and Tonopah. The meetings have been positive. No agreements are in place with the counties or the Tonopah Town Board.

WVM started work on permitting Three Hills Mine in June, 2014, with the final key permit issued in June, 2016, as summarized in Table 20.1.

Table 20-1 Three Hills Mine – Key Permit Acquisition Schedule

(from WVM, 2023)

Key Permits		
Permit/ Approval	Agency	Issued
Approval of Mine Plan of Operation	US Bureau of Land Management	11/25/2015
New Class I Air Quality Operating Permit to Construct (OPTC)	NV Bureau of Air Pollution Control	6/7/2016
New Class II Air Quality Operating Permit to Construct (AQOP)	NV Bureau of Air Pollution Control	6/7/2016
Mercury Operating Permit to Construct (MOPTC)	NV Bureau of Air Pollution Control	6/7/2016
Reclamation Permit (NRP)	NV Bureau of Mining Regulation and Reclamation	12/3/2015
Water Pollution Control Plan (WPCP)	NV Bureau of Mining Regulation and Reclamation	10/31/2015
Artificial Pond Permit	Nevada Department of Wildlife	To be applied for at construction decision
Dam Safety Permit	Nevada Division of Water Resources	To be applied for at construction decision
Hazardous Material Storage Permit	Nevada State Fire Marshal	To be applied for at construction decision
County Road Maintenance Agreement	Esmeralda and Nye Counties	To be applied for at construction decision

WVM started work on obtaining the federal permit and state reclamation permit to construct, operate, and close Hasbrouck Mine in November, 2016, with the final permit issued in November, 2020, as summarized in Table 20-2.

Table 20-2 Hasbrouck Mine– Key Permit Acquisition Schedule

Key Permits		
Permit/Approval	Agency	Issued
Decision Record/ Finding of No Significant Impact (DR/FONSI)	US Bureau of Land Management	11/4/2020
Reclamation Permit (NRP)	NV Bureau of Mining Regulation and Reclamation	11/17/2020
New Class I Air Quality Operating Permit to Construct (OPTC)	NV Bureau of Air Pollution Control	To Be Obtained
New Class II Air Quality Operating Permit (AQOP)	NV Bureau of Air Pollution Control	To Be Obtained
Mercury Operating Permit to Construct (MOPTC)	NV Bureau of Air Pollution Control	To Be Obtained
Water Pollution Control Plan (WPCP)	NV Bureau of Mining Regulation and Reclamation	To Be Obtained

Application will be made for other state permits and approvals at the time that construction is commenced at Three Hills Mine.

Make-up water for both mines is planned to be appropriated ground water from two wells installed at Three Hills Mine. WVM has leased certified water rights from a nearby mine (Permits 90479 and 90480) which permits WVM to appropriate ground water from the wells to be installed at Three Hills Mine for use at both mines. Because Three Hills Mine and Hasbrouck Mine are in different hydrographic basins, approval was sought and received from the Nevada state engineer for the transfer of water from one basin to another in January 2019.

WVM will comply with applicable federal and state environmental statutes, standards, regulations, and guidelines in the permitting of the Hasbrouck Project.

The following sections provide additional detailed information on the principal permits necessary to develop each property, the NEPA process, and the status of each permit.

20.1 MINERAL EXPLORATION

Mineral exploration at both Hasbrouck Mine and Three Hills Mine is authorized by the Nevada Bureau of Mining, Regulation and Reclamation (BMRR) and the Bureau of Land Management (BLM) under the two Mine Plans of Operation (MPO, Plan of Operations, or Plan) and multiple Notices. Each Notice authorizes up to five acres of disturbance and is bonded with the BLM. Current bond amounts for each MPO and Notice are shown in Table 20-3.

Table 20-3. WVM Mining (USA) and WK Allied Hasbrouck LLC's Notices

Property	BLM Serial #	Current Bond Obligated (US$)
Three Hills MPO - Phase 1	NVN093515	$112,770
Hasbrouck MPO - Phase 1	NVN095856	$53,205
Klondike Flats - NOI	NVN96619 (repl 89964)	$13,333
Hasbrouck - NOI	NVN100284	$6,797
Hill of Gold - BNOI	NVN95115	$13,166
Obligated		$199,271
Posted Bond	NVB2167	$199,271

20.2 BLM PLAN OF OPERATIONS / BMRR NEVADA RECLAMATION PERMIT

Generally, the BLM and the BMRR have implemented a process for Plan Application processing that commences before submitting the Plan Application, and continues through the review and approval process for the Plan Application. WVM submitted a Plan Application for Three Hills Mine which was approved in November 2015, and for Hasbrouck Mine in September 2017 which was approved in November 2020.

20.2.1 BLM PRE-APPLICATION PLANNING

Generally, a pre-application meeting is part of the BLM pre-application planning process. It is scheduled by the proponent and the BLM to discuss the anticipated scope of the mining operation and to review the environmental resource baseline data that will likely be required by the BLM in the Plan Application. Pre-application meetings generally occur one to two years before submitting the Plan, this time varying with the complexity of the mining operations and baseline data needs. A pre-application meeting between WVM and the BLM Tonopah field office took place on October 1, 2014 for Three Hills Mine, and on January 31, 2017 for Hasbrouck Mine.

The process for collecting baseline data generally includes developing baseline data collection work plans which are submitted to the BLM for review and approval. Once approved, baseline data collection proceeds at the proponent's discretion. Following such approval, field surveys are carried out to collect relevant baseline data. Desktop studies may be utilized in lieu of field surveys for certain baseline studies. Field survey findings are summarized in a report which is submitted to the BLM for review and approval. In some cases, and depending on the resource being assessed, the baseline data collection process also involves the State of Nevada, e.g. geochemical and hydrological surveys.

At both Three Hills Mine and Hasbrouck Mine, environmental baseline data collected in connection with the permitting effort there included:

- Ore and waste rock geochemical characterization;
- Hydrogeological characterization;
- Analysis of utilizing Tonopah Public Utilities water supply;
- Air quality modeling;
- Botanical and wildlife surveys, including noxious weeds;
- Socioeconomic assessment;

- Visual assessment;
- Cultural resources inventory;
- Traffic study, noise study, and
- Blasting vibration impacts analysis.

20.2.2 PLAN OF OPERATIONS PROCESSING

The process of Plan Application involves submitting a Plan to the BLM and BMRR for surface disturbance in excess of five acres. The single application utilizes the format of the Plan document accepted by the BLM and BMRR. The Application describes the operational procedures for the construction, operation, and closure of the project. BLM and BMRR required that the Plan Application includes:

- A waste rock management plan;
- Quality assurance plan;
- A storm water spill contingency plan;
- A spill prevention plan;
- Reclamation plan;
- A monitoring plan;
- An interim management plan; and
- A Reclamation Cost Estimate ("RCE") for the closure of the project.

Generally, a Plan is based on the mine plan design and environmental baseline studies. It includes all mine and processing design information and mining methods. The BLM determines the completeness of the Plan Application and, when the completeness letter is submitted to the proponent, the National Environmental Policy Act (NEPA) process begins. The RCE is reviewed by both agencies and the bond amount is determined prior to the BLM issuing a Decision Record on the Plan Application and BMRR issuing a Nevada Reclamation Permit (NRP). A Plan Application for Three Hills Mine was prepared and submitted to the BLM and the BMRR in May 2015, and a Decision Record was issued in November 2015. An NRP was issued in December 2015.

A Plan Application for Hasbrouck Mine was prepared and submitted to the BLM and the BMRR in October 2017, and a Decision Record was issued in November 2020. An NRP was also issued in November 2020.

20.3 NATIONAL ENVIRONMENTAL POLICY ACT

The NEPA process is triggered by a federal action and, as was the case at Three Hills Mine and Hasbrouck Mine, the issuance of a completeness letter for the Plan is the trigger for the federal action. The NEPA review process is completed by either an EA or an EIS.

20.3.1 ENVIRONMENTAL ASSESSMENT PROCESS

The EA process is conducted in accordance with NEPA regulations (40 CFR 1500 et. seq.), BLM guidelines for implementing the NEPA in BLM Handbook H-1790-1 (updated January 2008), and BLM Washington Office Bulletin 94-310. The intent of the EA is to assess the direct, indirect, residual, and cumulative effects of a project, and to determine the significance of those effects.

Scoping is conducted by the BLM and includes a determination of the environmental resources to be analyzed in the EA, as well as the degree of analysis for each environmental resource. The scope of the cumulative analysis is also addressed during the scoping process. Following scoping and baseline information collection, the EA is either prepared by the BLM, or prepared by a third party contractor for the BLM. When the BLM determines that the EA is complete, a Preliminary EA is made available to the public for review. Comments received from the public will be incorporated into a Final EA, or included in the Decision Record and Finding of No Significant Impacts.

For Three Hills Mine the BLM held their internal NEPA kick-off meeting on April 30, 2015, at which time it was determined that because the project area was less than one square mile, and that there were no significant impacts and no negative socio-economic issues, an EA was the appropriate approach to comply with NEPA.

For Hasbrouck Mine the BLM held their internal NEPA kick-off meeting on January 9, 2020, at which time it was determined that because the project area was less than one square mile, and that there were no significant impacts and no negative socio-economic issues, an EA was the appropriate approach to comply with NEPA.

20.3.2 ENVIRONMENTAL IMPACT STATEMENT PROCESS

The EIS process is conducted in accordance with NEPA regulations (40 CFR 1500 et. seq.), BLM guidelines for implementing the NEPA in BLM Handbook H-1790-1 (updated January 2008), and BLM Washington Office Bulletin 94-310. The intent of the EIS is to assess the direct, indirect, residual, and cumulative effects of the project and to determine the significance of those effects. Scoping is conducted by the BLM and includes a determination of the environmental resources to be analyzed in the EIS, as well as the degree of analysis for each environmental resource. The scope of the cumulative analysis is also addressed during the scoping process. Following scoping and baseline information collection, a Draft EIS is prepared for the BLM by a third party contractor. When the BLM determines the Draft EIS is complete, it is submitted to the public for review. Comments received from the public are incorporated into a Final EIS, which is in turn be reviewed by the BLM and the public prior to a record of decision ("ROD"). Under an EIS there can be significant impacts. The preparation of an EIS is a lengthier and more expensive process than an EA. The project proponent pays for the third party contractor to prepare the EIS, and also pays recovery costs to the BLM for any work on the project by BLM specialists.

20.3.3 WATER POLLUTION CONTROL PERMIT

A WPCP was procured from the BMRR to construct, operate, and close a mining facility in the State of Nevada for Three Hills Mine, and another WPCP will be required for Hasbrouck Mine. The contents of an application are prescribed in the Nevada Administrative Code Section 445A.394 through 445A.399. A WPCP application will be prepared for the Hasbrouck Mine and will be based on the following:

- Open pit mining, with no anticipated pit lake formation;
- Storage of non-acid generating waste rock;
- Heap leaching with associated process water tanks and event ponds;
- Adsorption-Desorption-Recovery processing;
- Refining;
- Exploration;
- A water supply pipeline, associated water delivery pipelines, and power;

- A power substation and distribution system;
- Access and haul roads; and
- Ancillary facilities that include storm water diversions, sediment control basins, reagent and fuel storage, fresh water storage, monitoring wells, meteorological station, and solid and hazardous waste management facilities.

WPCP applications include:

- Engineering designs for waste rock storage areas and heap leach facilities;
- Waste rock characterization reports;
- Hydrogeological summary reports;
- Engineering designs for process components, including methods for the control of storm water runoff;
- Containment reports detailing specifications for containment of process fluids;
- A process fluid management plan;
- A monitoring plan;
- An emergency response plan;
- A temporary closure plan; and
- A tentative plan for permanent closure of the mine.

20.3.4 AIR QUALITY OPERATING PERMIT

Three Hills Mine has a New Class I AQOPC, necessary because the mining plan includes components that have the potential to emit mercury and a New Class II AQOP, issued by the Nevada BAPC in June, 2016.

Hasbrouck Mine requires a New Class I AQOPC because the mining plan includes components that have the potential to emit mercury and a New Class II AQOP, issued by the Nevada BAPC. Applications will include a description of each facility, a detailed emission inventory, and air quality modeling. Applications will also include locations, plot plans, and process flow diagrams.

Generally, BAPC issues an initial completeness determination within 30 days of receiving the permit application for an OPTC and 10 days for an AQOP, and any deficiencies in the application are addressed at that point. The BAPC then performs a technical review of the application and when complete, issues a draft permit. This permit is reviewed by the operator and, if deemed acceptable for operations, a final permit is issued. The permit issuance process is between six and nine months.

This process was followed for permitting Three Hills Mine and will be followed for permitting Hasbrouck Mine.

20.3.5 MERCURY OPERATING PERMIT TO CONSTRUCT

Generally, application for the MOPC is made to BAPC and includes a description of each facility, a detailed emission inventory, and a Maximum Achievable Control Technology ("MACT") assessment. The application will also include locations, plot plans, and process flow diagrams.

The BAPC issues an initial completeness determination within 30 days of receiving the permit application, and any deficiencies in the application are addressed at that point. The BAPC then performs a technical review of the application and, when complete, issues a draft permit. This permit is reviewed by the operator and, if deemed acceptable for operations, a final permit is issued. The permit issuance process is between six and nine months.

This process was followed when permitting Three Hills Mine and will be followed when permitting Hasbrouck Mine.

20.4 ESMERALDA COUNTY

An agreement with the Esmeralda County Board of County Commissioners for the maintenance of the county roads travelled by traffic accessing Three Hills Mine is in place and is in the form of Esmeralda County's standard road maintenance agreement.

20.5 NYE COUNTY

An agreement with the Nye County Board of County Commissioners for the maintenance of Knapp Avenue will be needed, this being one of two access routes to Three Hills Mine. At the time of writing, negotiations between WVM and Nye County are progressing amicably and no obstacles are anticipated in entering Nye County's standard form of road maintenance agreement.

20.6 OTHER PERMITS

In addition to the principal environmental permits outlined above, Table 20-4 lists other notifications or ministerial permits that will likely be necessary to operate Three Hills and Hasbrouck mines.

Table 20-4. Ministerial Permits, Plans, and Notifications

Notification/Permit	Agency	Timeframe	Comments
Mine Registry	Nevada Division of Minerals	30 days after mine operations begin	
Mine Opening Notification	State Inspector of Mines	Before mine operations begin	
Solid Waste Landfill	Nevada Bureau of Waste Management	180 days prior to landfill operations	
Hazardous Waste Management Permit	Nevada Bureau of Waste Management	Prior to the management or recycling of hazardous waste	
General Storm Water Permit	Nevada Bureau of Water Pollution Control	Prior to construction activities	
Hazardous Materials Permit	State Fire Marshall	30 days after the start of operations	
Fire and Life Safety	State Fire Marshall	Prior to construction	
Explosives Permit	Bureau of Alcohol, Tobacco, and Firearms	Prior to purchasing explosives	Mining contractor may be responsible for permit
Mine Identification Number	Mine Safety and Health Administration	Prior to start-up	
Notification of Commencement of Operation	Mine Safety and Health Administration	Prior to start-up	
Radio License	Federal Communications Commission	Prior to radio use	

20.7 ENVIRONMENTAL STUDY RESULTS AND KNOWN ISSUES

For Three Hills Mine, WVM collected baseline data in early 2014 for environmental studies necessary for the Plan Application and permitting process. Results indicated:

- Limited biological and cultural issues;
- Air quality impacts appear to be within State of Nevada standards;
- Traffic and noise issues are present, but at low levels; and
- Socioeconomic impacts are positive.

Allied Nevada, the former owner of the properties, initiated baseline data collection for the proposed Hasbrouck Mine in late 2013 and early 2014. WVM collected biology and botany data at the proposed Hasbrouck Mine in May 2015 and May through July 2017.

20.8 WASTE DISPOSAL, MONITORING, WATER MANAGEMENT

The following is based on WVM's Plan Applications to the BLM for Three Hills Mine and Hasbrouck Mine.

20.8.1 WASTE HANDLING AND DISPOSAL

WVM will institute a waste management plan that will identify the wastes generated at the site and their means of disposal. A training program will be implemented to inform employees of their responsibilities in proper waste disposal procedures. A landfill in the Project Area is not planned, and all solid wastes will be disposed off-site. Used lubricants and solvents will be characterized according to the Resource Conservation and Recovery Act (RCRA) and will be stored and disposed of appropriately. WVM will have a trained response team at the site 24 hours per day to manage potential spills of regulated materials at the site. Response for transportation-related releases of regulated materials bound for the site will be the responsibility of the local and regional agencies. However, where appropriate, WVM may assist with response to off-site incidents, including providing resources based on agency requests.

20.8.1.1 HAZARDOUS WASTES

WVM may obtain a Hazardous Waste Identification Number from NDEP. Three Hills and Hasbrouck mines are expected to be in the "conditionally exempt small quantity generator" category as defined by the U.S. Environmental Protection Agency ("EPA"). Used solvents are the only hazardous wastes identified as potentially existing at the mines at this time.

20.8.1.2 NON-HAZARDOUS WASTES

Used oil and coolant will be stored in secondary containment at Three Hills and Hasbrouck mines. These will be either recycled or disposed of in accordance with state and federal regulations. Used containers will be disposed of or recycled according to federal, state, and local regulations.

20.8.1.3 DOMESTIC WASTE DISPOSAL

Solid wastes generated by the mine and process departments at both Three Hills and Hasbrouck mines will be collected in dumpsters near the point of generation. Industrial solid waste will be disposed of in an off-site Class III landfill in accordance with NAC 444.731 through 444.737.

20.8.2 WASTE WATER (SEWAGE) DISPOSAL

Sanitation at Three Hills Mine will be by portable toilets, given that there are no offices or assay lab on site.

Sewage disposal will be handled at Hasbrouck Mine in a septic leach field and in portable toilets. No potable water system or septic field will be installed at Three Hills Mine; these requirements will be met at the administration offices and assay laboratory which will be located in the Town of Tonopah.

At Hasbrouck Mine, sewage drain-pipes will be routed from the administrative facilities and buildings containing running water to the septic leach fields. Leach fields will be sized and permitted to accommodate the anticipated number of employees and personnel at each site. Near equipment ready-lines or other areas where running water is not available, but where toilets will be required, portable toilets will be provided and serviced by a local contractor. A septic field with the capacity to treat waste for up to 100 persons will be installed to the west of the administration and warehouse buildings at the Hasbrouck Mine.

A centralized oil-water separator will be installed adjacent to the truck shops at the Three Hills and Hasbrouck mines to treat water from drains located at each maintenance bay and from the wash rack. The floor drains in the maintenance area will be designed to collect rainwater and snow melt from vehicles and equipment. Gray water from the oil/water separator will be collected in a tank within containment or a lined impoundment. Gray water will be recycled back to the wash system; excess water will be used for dust control. Separated oil will be stored either in a double-lined tank or a single-wall tank within a concrete containment, and collected and disposed of by a licensed waste collection contractor.

20.8.3 WASTE ROCK AND TAILINGS CHARACTERIZATION

Waste rock and tailings at both Three Hills Mine and Hasbrouck Mine has been characterized as inert and environmentally benign. As a result, waste rock management is expected to be by random placement with no impervious liner, and with quarterly sampling of placed materials.

20.9 SOCIAL AND COMMUNITY ISSUES

There are no known social or community issues that would materially impact WVM's ability to extract Mineral Resources at Three Hills and Hasbrouck mines. Identified socioeconomic issues (employment, payroll, services and supply purchases, and tax) are anticipated to be positive.

Some blasting at the Hasbrouck Mine will require brief closures of the adjacent U.S. Highway 95. Preliminary meetings with the Nevada Department of Transportation ("NDOT") indicate that shutting down a highway while blasting is performed for mining and road construction is routinely permitted on application.

20.10 MINE RECLAMATION

The following is based on WVM's Reclamation Plans, which are contained respectively within WVM's Plan Application to the BLM for Three Hills Mine and Hasbrouck Mine. Similar measures are being developed for Hasbrouck Mine.

Reclamation of disturbed areas resulting from activities outlined in the Reclamation Plan will be completed in accordance with BLM and NDEP regulations. The areas for disturbance can be divided into the following:

- Open pit;
- Waste rock storage areas;
- Heap leach facility;
- Borrow areas;
- Growth media stockpiles;
- Haul roads;
- Buildings and yard areas;
- Process plant;
- Administration;
- Laboratory; and
- Ancillary facilities.

WVM anticipates that with the exception of the open pit, surface mine components will be reclaimed and revegetated.

It is not economically feasible to reclaim the slopes of the open pit when mining is complete due to a number of factors including pit wall stability and geology, topography of the final pit configuration, potential adverse effects to the environment associated with the activities required for reclamation and maintaining access to Mineral Resources. WVM sought and gained exemption from NDEP BMRR under NAC519A.250 for reclamation of the slopes of the open pit at both Three Hills Mine and Hasbrouck Mine.

The final grading plan at each mine will be designed to minimize the visual impacts of disturbance. Slopes will be re-contoured to blend with surrounding topography, interrupt straight-line features and facilitate revegetation where practicable. Where feasible, large constructed topographic features such as waste rock storage areas, may be arranged to have rounded crests and variable slope angles to resemble natural landforms.

Reclaimed surfaces will be re-vegetated to control runoff, minimize erosion, provide forage for wildlife and livestock, and reduce visual impacts. Seedbed preparation and seeding will take place in the fall after grading and top-soiling of reclaimed areas.

20.10.1 CENTRAL OPERATING AREA (ADMINISTRATION, HLF, AND PROCESS)

During final mine closure, buildings and structures will likely be dismantled and materials will be salvaged or removed to an authorized landfill. Concrete foundations and slabs will be broken using a track-hoe mounted hydraulic hammer or similar methods and buried in place under approximately 3ft of material in such a manner to prevent ponding and to allow vegetation growth. After demolition and salvage operations are complete, the disturbed areas will be covered with approximately 12in of growth media and revegetated. Alternatively, buildings and structures may be left on private land in support of other industrial or commercial, post-mining land uses.

Reagents and explosives will be removed or appropriately disposed of. Surface pipelines will be removed and salvaged or disposed of. Underground pipeline ends will be capped and left in place. Unneeded utility poles will be cut off at ground level and removed.

20.10.2 HEAP LEACH FACILITY

The leach pad will be re-contoured to an average final slope configuration not steeper than 3H:1V to provide for long-term mass stability. The toe of the re-contoured slope will be inside the lined facility, and subsequently placed cover material will direct surface runoff away from the lined area of the pad. Re-contoured sides-slopes will include slope breaks horizontally along contour approximately every 100 vertical feet. Slope breaks will be small flat benches up to 20ft wide and blended into the slopes. The toe and crest of the facility will also be rounded to blend into the adjacent slopes. Minimizing the total continuous slope length with benches, and rounding the toe and crests, will help to limit erosion until vegetation is established.

Growth media will be hauled to the heap leach surfaces from growth media stockpiles and to the borrow areas. The cover for the heap leach pad will generally be designed to accomplish the following;

- Limit infiltration of meteoric water;
- Isolate process materials from storm water runoff;
- Limit erosion; and
- Support successful revegetation.

20.10.3 MINE PITS

Operational and post-closure open pit slope configurations will be controlled by several parameters that include the geometry of the ore body, geologic and geotechnical characteristics of the host rock, equipment constraints, and safe operating practices. The open pit walls will be too steep to allow soil replacement and revegetation due to access logistics and safety concerns. Open pit ramps will be barricaded to prevent entry by the public. The open pit floor and ramps are expected to be competent rock surfaces that will be stable without reclamation. These areas have little or no potential to support vegetation. There are no plans to re-vegetate the open pit.

During final reclamation, a physical barrier (e.g., berms, fencing, or other appropriate barriers) will be installed along the open pit crest areas to control access by people, livestock, and large wildlife. Post-mining modifications of open pit walls to decrease slope angles are not planned.

20.10.4 WASTE ROCK STORAGE AREAS

Waste rock storage areas will be reclaimed to minimize slope erosion, create mass stability, round edges, revegetate surfaces, and minimize soil loss, consistent with the surrounding topographic features. The final slopes of the reclaimed waste rock storages facilities will have slopes of 3H:1V or shallower, up to 100ft high benches, and 20ft wide intermediate benches to reduce surface water flow velocities and erosion. Reclamation of the waste rock storage areas will be conducted concurrently with regular mine operations to the extent reasonable. It is anticipated that the waste rock storage areas will be constructed in multiple lifts with setbacks between lifts that will facilitate final grading. To the greatest extent practicable, areas of the waste storage facilities that reach their ultimate configurations and become inactive during the active mining phase will be re-contoured and covered with 12in of stockpiled salvaged growth media and seeded.

20.10.5 ROADS

Roads without a defined post-mining use will be reclaimed concurrent with mining operations as they become no longer needed. Where the original topography exceeds 3H:1V, road cuts will be filled with road bed material to blend with existing topography and to ensure no steeper than 3H:1V slopes, except where located generally in bedrock. There are no planned asphalt roads or parking areas. Roads and safety berms will be re-contoured or re-graded to approximate original contour. Where the road is located on fill, the side slopes will be rounded and re-graded to 2.5H:1V. Finished slopes will be generally similar in character to the surrounding topography. Compacted road surfaces will be ripped, covered with growth media from the safety berms or road fill, and revegetated.

Certain access roads will be needed after mine closure to access monitoring points. As monitoring is completed and the facility is considered to be finally closed, such access roads will be reclaimed.

As determined by the BLM, roads on public lands suitable for public access, or which continue to provide public access consistent with pre-mining conditions, will not be reclaimed at mine closure. Narrow access roads may remain on large haul roads after they have been re-contoured and seeded.

20.11 MINE CLOSURE

Reclamation and site closure activities shall be performed in accordance with the NRPs and WPCPs for Three Hills Mine and Hasbrouck Mine, as summarized in the following sections.

20.11.1 SLOPE STABILIZATION

Slope stability analyses on the waste rock storage areas were performed using industry practices and experience from similar projects. Where possible, the outside portions of the final waste rock storage areas will be constructed such that variable topography will be achieved during reclamation re-contouring.

The walls of the open pit will generally have an overall slope of 35º to 45º.

20.11.2 FINAL ENGINEERING AND MONITORING PLANS

WVM will adhere to BMP and BMRR standards and specific requirements for post reclamation monitoring. Post reclamation monitoring and maintenance will include the following:

- Following mine closure, berm and sign maintenance, site inspections, and any other necessary monitoring for the period of reclamation responsibility will be conducted. Monitoring of re-vegetation success will be conducted annually until the re-vegetation standards have been met and will include noxious weed monitoring and abatement as necessary.
- WVM will monitor heap-leach pad flow and chemistry. Mitigation will be developed if necessary. Post-mining ground water quality will be monitored for 5 years according to the requirements established by the NDEP upon approval of the WPCP with the goal of demonstrating the site poses no potential to degrade waters of the state through the successful implementation of the detailed Final Plan for Permanent Closure.
- Re-vegetation monitoring will be conducted for a minimum of five years following implementation of re-vegetation activities or until re-vegetation success has been achieved. Re-vegetation monitoring will occur based on seasonal growth patterns, precipitation, and weather conditions.
- Noxious weed monitoring and control will be implemented for a five-year period following closure.

20.11.2.1 HEAP DRAIN-DOWN AND NEUTRALIZATION

Drain-down of water from within the HLFs will continue for several years after closure. Drain-down flow rate at the start of the closure period will be at the operational flow rate and will steadily decline over a number of years until reaching a steady state condition where inflow of meteoric water through the cover will equal the outflow. When the steady state is reached, outflows will be disposed of in a passive evaporation system made by converting the event pond into evapotranspiration cells ("ET cells"). Initially, outflows will exceed what can be handled by the ET cells; excess outflows will be disposed of by an active evaporation system (mechanical misting devices).

Monitoring wells around the heap leach facility will be maintained until WVM is released from this requirement by the NDEP. These wells will then be plugged and abandoned according to the requirements of the State Engineer.

20.11.2.2 PONDS AND PUMP STATIONS

When no longer needed for solution management, the event pond at each mine will be converted into evapotranspiration ("ET") cells or reclaimed. Assumptions have been made to convert the event pond into an ET cell because the cell is a double-lined facility with leak collection and recovery system ("LCRS"). As part of the design, the converted ET cell will be covered with six inches of growth media and seeded.

Solids are expected to be present in some quantity in the process tanks and event pond at the time of closure. Representative samples will be obtained to determine the chemical characteristics of the pond solids. Depending on the results of the characterization testing, the solids will be left in the pond and buried in place in the event pond, under the ET cell cover, or removed and placed in an approved landfill.

20.11.2.3 ROADS, DIVERSION WORKS AND EROSION CONTROLS

Runoff from waste rock storage areas and other slopes will occur following precipitation events. However, re-graded slope angles, re-vegetation (including growth media placement) and Best Management Practices ("BMPs") will be used to limit erosion and reduce sediment in runoff. Silt fences, sediment traps, and other BMPs will be used to prevent migration of eroded material until reclaimed slopes and exposed surfaces have demonstrated erosional stability.

20.11.2.4 FENCING

To prevent access by livestock, wildlife, and the public, a 20,500ft perimeter fence will be constructed around Three Hills Mine facilities and a 33,000 ft perimeter fence will be constructed at Hasbrouck Mine. In general, three strand barbed wire fences will be used per BLM Handbook 1741-1. The area within the perimeter fence is approximately 476 acres at Three Hills and 1,288 acres at Hasbrouck Mine. Chain-link fences will be erected within the perimeter fence in areas where a higher level of security is needed, such as the event pond, in order to protect livestock and other animals from entry. These will be removed at closure after the ponds are reclaimed. The perimeter fence will be monitored on a regular basis and repairs made as needed. Gates or cattle guards will be installed along roadways, as appropriate.

21.0 CAPITAL AND OPERATING COSTS

All monetary values in this section are in US dollars.

RESPEC has authored Section 21, Capital and Operating Costs, with subsections for Process Capital and Process Operating costs provided by KCA. NewFields has provided inputs for leach-pad Capital and some input to Infrastructure Capital Costs, which are included in the Other Capital Costs (Section 21.9).

Capital costs at the start of the project are attributed to the startup of Three Hills Mine at $66,172,000, which includes $4,864,000 of working capital. An additional $127,310,000 in capital is required as "Growth" capital for the startup of Hasbrouck which is primarily funded by revenues from Three Hills Mine. Sustaining capital was estimated to be $28,571,000 which includes the return of working capital. Total life-of-project capital is $222,053,000. Direct capital costs include sales tax.

Working capital is estimated based on the additional operating capital for Month 1 required prior to development of sufficient revenues to maintain a positive cash balance. This capital is retained in account until the project is sustainable with a positive cumulative cash flow, which occurs in year 1.

Marsh Canada advise that a surety bond to cover the full bonding amounts for both Three Hills and Hasbrouck mines. Three Hills Mine initial capital includes $1,283,000 in environmental bonding costs, this being 20% of the predicted bonding amount of $6,414,000, the balance of $5,131,000 being covered by a surety bond. The cost to maintain the surety bonding was included in G&A operating costs using 2% of the residual bond after initial capital per month cost. For Hasbrouck, it is assumed that the total bonding cost will be $7,420,000 and the 20% cash portion will be $1,484,000 with the remaining $5,936,000 being covered in the operating cost with Surety bond of 2% per month. The initial Three Hills bond payment of $1,283,000 is assumed to be released in year 6.

No sustaining capital was attributed to Three Hills mine.

Table 21-1 shows the estimated capital costs for both Three Hills and Hasbrouck mines. This is returned to the cash flow as a credit in Year 1 when the operation is projected to generate a positive cash balance more than the initial working capital amount (some equity financed capital may remain in the project). This is shown in the cash-flow portion of the economic analysis presented in Section 22.2, Table 22-4. Capital and operating costs estimates are based on 4th quarter 2022 costs.

Table 21-1. Hasbrouck Project Capital Cost Summary

Direct Costs	Units	Initial	Growth	Sustaining	Total
Pre-Production	K USD	$ 5,021	$ 190		$ 5,211
Mining	K USD	$ 184	$ 77	$ 127	$ 388
Plant and Recovery	K USD	$ 15,584	$ 64,603	$ -	$ 80,187
Leach Pads	K USD	$ 11,132	$ 14,713	$ 13,613	$ 39,458
Ponds and Site Infrastructure	K USD	$ 3,291	$ 4,981	$ -	$ 8,272
Water Supply	K USD	$ 5,747	$ 5,895	$ -	$ 11,641
Roads	K USD	$ 907	$ 1,501	$ -	$ 2,409
Environmental	K USD	$ -	$ -	$ -	$ -
Light Vehicles	K USD	$ 712	$ 160	$ 490	$ 1,363
Site and Administration	K USD	$ 47	$ 77	$ -	$ 124
Safety & Security	K USD	$ 82	$ 5	$ 10	$ 97
Owner's Capital	K USD	$ 6,247	$ 2,024	$ 12,484	$ 20,754
Total Direct Costs	K USD	$ 48,953	$ 94,227	$ 26,723	$ 169,904
Indirect Costs					
Initial Fills	K USD	$ 211	$ 470	$ -	$ 681
Indirects	K USD	$ 1,895	$ 3,099	$ 613	$ 5,607
EPCM	K USD	$ 2,721	$ 9,417	$ 749	$ 12,887
Newmont Buyout	K USD	$ -	$ 1,000	$ -	$ 1,000
Total Indirects	K USD	$ 4,827	$ 13,986	$ 1,361	$ 20,175
Contingencies					
Mining (15%)	K USD	$ 395	$ 30	$ -	$ 425
Plant and Recovery (20%)	K USD	$ 3,000	$ 12,240	$ -	$ 15,240
Leach Pads (15% - 25%)	K USD	$ 1,670	$ 3,678	$ 3,403	$ 8,751
Roads, Ponds, Water, and Infrastructure (25%)	K USD	$ 1,399	$ 2,808	$ -	$ 4,208
Other (15%)	K USD	$ 1,063	$ 340	$ 1,948	$ 3,351
Total Contingency	K USD	$ 7,528	$ 19,096	$ 5,351	$ 31,975
Total Capital Cost	K USD	$ 61,308	$ 127,310	$ 33,435	$ 222,053
Working Capital	K USD	$ 4,864	$ -	$ (4,864)	$ -
Net Capital on Summary Sheet	K USD	$ 66,172	$ 127,310	$ 28,571	$ 222,053

Mining and re-handle operating costs were estimated based on contractor quotations. Processing operating costs were estimated by KCA and provided to RESPEC in the form of fixed and variable costs. These costs were then applied to the process schedule by RESPEC to generate the LOM processing costs General and administrative costs and Nevada's net proceeds tax were estimated by RESPEC. Reclamation costs were estimated by Westland Engineering & Environmental Services, using BLM reclamation cost estimate spreadsheets. These reclamation costs were reviewed by Mr. Paul Sterling, a consultant to WVM and are found to be acceptable to RESPEC QP's.

Total estimated costs are $10.36 per ton of ore. Table 21-2 shows a summary of the operating cost estimate. Note the economic summary shown in Section 22 (Table 22-1) shows cost per ton of ore and shows an apparent discrepancy with the mining cost in Table 21-2. This is due to the inclusion of re-handle costs into the mining cost per ton of ore in the economic summary. Additionally, the total costs shown in Table 22-1 are based on the definition of the World Gold Council's Adjusted Operating Cost per ton of ore, for a total of $10.02 per ton of ore, which includes a credit for silver production and does not include reclamation (as per the World Gold Council Adjusted Operating Cost definition). The costs in Table 21-2 do not include silver credits and do include reclamation.

Table 21-2. Operating Cost Summary

Operating Costs		K USD	USD per ton Processed
Three Hills	Mining Cost	$ 37,008	$ 3.83
	Process Cost	$ 32,145	$ 3.33
Hasbrouck	Mining Cost	$ 140,156	$ 1.86
	Process Cost	$ 173,301	$ 5.04
	Re-handle	$ 4,210	$ 0.12
Total	Mining Cost	$ 177,163	$ 4.02
	Process Cost	$ 205,446	$ 4.67
	Re-handle	$ 4,210	$ 0.10
	G&A Cost	$ 22,804	$ 0.52
	Reclamation - Three Hills	$ 7,030	$ 0.16
	Reclamation - Hasbrouck	$ 8,766	$ 0.20
	Net/Gross Proceeds	59%	
	Nevada Net Proceeds Tax	$ 30,538	$ 0.69
	Net Operating Cost	$ 455,957	$ 10.36

21.1 MINING CAPITAL

Projected mining capital is minimized by planning to use a contractor for mining operations. Mining capital costs have been split into contract mining capital and owner mining capital, where the contractor mining capital includes mobilization, demobilization, and pre-production capital. Pre-production contract mining capital includes construction of roads and establishing initial benches (pioneering) prior to production mining. All pre-production contractor costs are included in the cash flow as pre-production capital totaling $2.5 million.

Owner mining capital includes mining software, operations offices, office furnishings and computers, and communications equipment and totals $184,000 for initial mining and an additional $77,000 at the start of Hasbrouck. Light vehicles total $712,000 for initial capital, and the life of the project light vehicle capital is estimated to be $1,363,000. Mining capital is summarized in Table 21-3 and totals $4.4 million when added together. Estimated mining capital costs were based on vendor or contractor quotations. Note that light vehicle capital for mining is discussed in Section 21.6, Other Capital Costs.

Estimated mining capital costs were based on vendor or contractor quotations. Note that light vehicle capital for mining is discussed in Section 21.6, Other Capital Costs.

Table 21-3. Summary of Estimated Project Mining Capital

Three Hills - Contract Mining Capital	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Mobilization	K USD	$ 284	$ -	$ 120	$ -	$ -	$ -	$ -	$ -	$ -	$ 404
Road Construction / Pioneering	K USD	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
Pre-Production - Mining	K USD	$ 2,119	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,119
Total Three Hills Pre-production Mining Capital	K USD	$ 2,453	$ -	$ 120	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,573
Hasbrouck - Contract Mining Capital											
Demobilization	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 127	$ 127
Road Construction / Pioneering	K USD	$ -	$ -	$ 70	$ -	$ -	$ -	$ -	$ -	$ -	$ 70
Total Hasbrouck Pre-production Mining Capital	K USD	$ -	$ -	$ 70	$ -	$ -	$ -	$ -	$ -	$ 127	$ 197

Owner Mining Capital	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Software	K USD	$ 155	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 155
Mine Operations Offices	K USD	$ -	$ -	$ 77	$ -	$ -	$ -	$ -	$ -	$ -	$ 77
Computers, Printers, and Plotters	K USD	$ 26	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26
Communications (phones, internet, etc)	K USD	$ 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3
Owner Mining Capital Total	K USD	$ 184	$ -	$ 77	$ -	$ -	$ -	$ -	$ -	$ -	$ 261
Total Mining Capital Costs	K USD	$ 2,637	$ -	$ 267	$ -	$ -	$ -	$ -	$ -	$ 127	$ 3,031

Light Vehicles	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Mining	K USD	$ 202	$ -	$ -	$ -	$ -	$ 152	$ -	$ -	$ -	$ 354
Processing	K USD	$ 332	$ -	$ 160	$ -	$ -	$ 110	$ -	$ -	$ -	$ 602
Administration	K USD	$ 178	$ -	$ -	$ -	$ -	$ 229	$ -	$ -	$ -	$ 407
Total	K USD	$ 712	$ -	$ 160	$ -	$ -	$ 490	$ -	$ -	$ -	$ 1,363

21.2 THREE HILLS PROCESS CAPITAL

Process capital and operating costs are considered to have an accuracy of +/-20% and are based on 4th quarter 2022 US dollars. Three Hills process plant capital cost is $21.0 million (including indirects, contingencies, initial fills, and EPCM, but excluding working capital).

Each area in the process cost build-up is separated into the following disciplines, as applicable:

- Earthworks;
- Liners and Ponds;
- Civils and Foundations;
- Structural Steel;
- Platework;
- Mechanical Equipment;
- Piping, Electrical and Instrumentation;
- Facilities
- Freight; and
- Sales and Other Taxes.

Three Hills Mine Process Capital Cost summary is presented by area in Table 21-4. The cost summary by discipline is presented in Table 21-5.

Table 21-4 KCA Three Hills Mine Process Capital Costs by Area

Plant Totals Direct Costs	Total Supply Cost	Install	Grand Total
	US$	US$	US$
Area 0000 - Site & Utilities General	$586,214	$710,592	$1,296,806
Area 1403 - Laboratory (Shared w/ Hasbrouck)	$1,013,012	$621,906	$1,634,919
Area 4179 - Electrical	$812,200	$187,000	$999,200
Area 4290 - Mobile Equipment	$1,992,746	$0	$1,992,746
Area 4301 - Water Distribution	$1,048,197	$279,360	$1,327,557
Area 5004 - Primary Crushing	$0	$0	$0
Area 5023 - Secondary & Tertiary Crushing	$0	$0	$0
Area 5041 - Ore Reclaim & Stacking	$0	$0	$0
Area 5150 - Heap Leach & Solution Handling	$3,313,236	$616,140	$3,929,376
Area 5184 - Adsorption	$2,671,091	$347,658	$3,018,749
Area 5184 - Acid Wash & Elution	$0	$0	$0
Area 5184 - Carbon Handling & Regeneration	$0	$0	$0
Area 5186 - Electrowinning & Refining	$0	$0	$0
Area 5188 - Detoxification	$0	$0	$0
Area 6051 - Reagents	$64,178	$48,480	$112,658
Ancillaries	$67,121	$74,660	$141,781
Plant Total Direct Costs	$11,567,995	$2,885,797	$14,453,792
Sales Tax & Other Taxes	$625,073		$625,073
Spare Parts	$529,133		$529,133
Sub Total with Spare Parts			$15,607,998
Contingency	$3,000,000		$3,000,000
Plant Total Direct Costs with Contingency			$18,607,998
Indirect Field Costs			$530,000
Initial Fills			$421,573
Sub Total Plant Cost Before EPCM			$19,559,571
EPCM			$1,400,000
TOTAL Pre-Production Capital Cost			$20,959,571
Working Capital (90 days)			$3,902,845
Total Attached Power (kW)			1,631

Table 21-5 KCA Three Hills Mine Process Capital Costs by Discipline

Discipline	Cost @ Source	Freight	Total Supply Cost	Sales & Other Taxes	Install	Grand Total
	US$	US$	US$	US$	US$	US$
Major Earthworks		$0	$0	$0	$150,000	$150,000
Civils (Supply & Install)		$0	$1,521,000	$52,094	$0	$1,573,094
Structural Steelwork (Supply & Install)		$0	$430,100	$14,731	$324,018	$768,849
Platework (Supply & Install)		$40,656	$1,208,305	$46,416	$0	$1,254,721
Mechanical Equipment		$237,254	$4,661,946	$308,774	$790,846	$5,761,567
Piping		$38,109	$1,198,231	$76,827	$317,280	$1,592,339
Electrical		$0	$2,135,904	$104,494	$1,182,052	$3,422,450
Instrumentation		$0	$142,019	$6,535	$39,040	$187,594
Facilities		$11,065	$270,489	$15,202	$82,560	$368,251
Spare Parts		--	$529,133	--	--	$529,133
Contingency		--	$3,000,000	--	--	$3,000,000
Plant Total Direct Costs	$0	$327,085	$15,097,128	$625,073	$2,885,797	$18,607,998

Capital costs for the heap-leach process facility at Three Hills have been estimated by KCA and NewFields. Newfield's scope of work was the construction of the leach pad and ponds, earthworks, liner, civils, gravity piping, and off-site water supply. KCA's scope of work was the solution application equipment (pumps, tanks, etc.), pressure piping, laboratory and laboratory equipment, reagent mixing and storage, the CIC adsorption plant, on-site power supply and distribution, and certain infrastructure.

Three Hills capital costs estimated by NewFields are shown in Table 21-6. This includes capital costs for access roads to and around the Three Hills Mine site.

Table 21-6 NewFields Estimated Capital for Three Hills Mine (K USD)

NewFields Estimated Capital Costs	Three Hills Year -1
Roads	$ 907
Heap Leach Facility	$ 11,132
Event Ponds & Site Infrastructure	$ 3,291
Water Supply	$ 5,747
Total	**$ 21,077**
Indirects	$ 1,365
EPCM	$ 1,450
Contingency	$ 3,069
Total Estimated by NewFields	**$ 26,961**

21.2.1 THREE HILLS MINE HLF

The HLF includes the earthworks, HDPE geomembrane, gravity drain piping and gravel overliner materials within the leach pad. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.2.2 THREE HILLS MINE EVENT POND

The event pond includes the earthworks, HDPE geomembrane, and miscellaneous piping. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.2.3 THREE HILLS MINE CIVILS AND FOUNDATIONS

Civils include detailed earthworks and concrete. Concrete in KCA's scope includes the reagent storage area concrete slab and containment berms, and the process plant workshop foundation; concrete is also included for the substations. Concrete for the laboratory and the adsorption columns foundation have been included in KCA's equipment supply quote. Concrete quantities estimated by KCA are based on similar installations, major equipment weights and on slab areas. Concrete costs have been estimated by KCA based on supplier quotes from recent projects completed by KCA in the area. These costs include all form work, footing excavation, concrete supply, rebar, water stops, and curing costs.

21.2.4 THREE HILLS MINE STRUCTURAL STEEL

Structural steel includes steel grating, handrails and structural steel. Structural steel for all areas within KCA's scope has been included in KCA's equipment supply package quote.

21.2.5 THREE HILLS MINE PLATEWORK

The platework discipline includes costs for the supply and installation of steel tanks, bins, and chutes. Platework costs for items in KCA's scope have been included in KCA's quoted equipment supply package.

21.2.6 THREE HILLS MINE MECHANICAL EQUIPMENT

Costs for mechanical equipment are based on an equipment list developed of all major equipment for the processing facility. Costs for most major items are for new equipment and based on budgetary quotes from vendors. Costs for minor equipment items are based on supplier quotes or KCA's in-house database, or else reasonable allowances for the equipment were made.

Installation hourly costs for mechanical equipment are factored based on the equipment supply cost and include installation labor and equipment usage.

21.2.7 THREE HILLS MINE PIPING, ELECTRICAL AND INSTRUMENTATION

Major piping in KCA's scope includes the main header to the heap leach, the solution irrigation piping and the fire water distribution piping. Costs for major piping are based on material takeoffs developed by KCA and supplier quotes. Ancillary piping, fittings, and valve costs have been estimated on a percentage basis of the mechanical equipment costs. Varying factors ranging up to 25% of the mechanical equipment supply were used to estimate the ancillary piping purchase costs for each area.

On-site electrical costs for the project are primarily based on supplier quotes based on material takeoffs and information developed by KCA. These include LNG generator rentals, site distribution power lines, transformers, and substations. Miscellaneous electrical costs have been estimated as a percentage of the equipment supply cost. Varying factors ranging up to 15% of the equipment supply package have been used for miscellaneous electrical costs.

Instrumentation costs are based on a percentage of the mechanical equipment and range up to 5% of the mechanical equipment cost. An allowance of $5,000 has been included for a valve and control for the site water supply. An allowance of $50,000 has been included for a security system, which includes a closed-circuit television system. Minimal instrumentation is planned for the project.

21.2.8 THREE HILLS MINE INSTALLATION AND COMMISSIONING

Installation costs have been included for all items in KCA's equipment supply package. Installation estimates for all other items are based on a sliding scale factored from the supply cost and include all installation labor and equipment usage. The hourly installation labor rates are estimated to be $80.00/hour and include provisions for wages, burdens, overhead and contractor profit. The estimated unit cost is based on information in KCA's database and current proprietary cost guide data.

21.2.9 THREE HILLS MINE FREIGHT

Freight costs have been included in KCA's equipment supply package. Freight estimates for other equipment, including major piping, are based on loads as bulk freight at an average percentage of equipment cost. The cost for transport of equipment items to the jobsite in Tonopah, Nevada has been estimated at an average of 6% of the equipment cost.

21.2.10 THREE HILLS MINE SALES TAX AND OTHER TAXES

Nevada sales tax in Esmeralda County has been applied to all material supply costs for the items in this area. Sales tax was applied to 50% of the value of any allowance that did not have a breakdown between supply and installation costs. The effective sales tax in Esmeralda County as of the Effective Date of this report is 6.850%.

21.2.11 THREE HILLS MINE SITE EARTHWORKS CAPITAL COSTS

The site earthworks include site access roads, the haul road between the lime storage silo and the HLF, general site grading at the buildings and other facilities around the plant site and the explosives storage magazine road. The earthworks costs include shaping and grading, road wearing coarse, and any drainage components required to control and convey storm water runoff. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.2.12 THREE HILLS MINE POWER SUPPLY & DISTRIBUTION CAPITAL COSTS

Power for Three Hills Mine will be by a rented on-site LNG-powered generator, which has been quoted by Aggreko.

Power distribution onsite has been quoted by Jensen Engineering and includes the site distribution power lines and transformers. Capital costs for the site power distribution are included in the project direct costs.

A 750 kW backup generator is included in the cost estimate to provide power to the critical pumping systems and facilities in the event of a power outage.

21.2.13 THREE HILLS MINE WATER CAPITAL COSTS

Raw water for the project, including fire water, will be sourced from two groundwater wells located approximately 3,700 ft north of the process facilities. NewFields has estimated the costs of the well drilling and development, pump installation, and pipeline and delivery system. These costs were derived from a proposed well design, site layout drawings and estimated labor and equipment rates based upon recent, similar, project experience and from vendor quotes. Power supply and electrical transformer costs were included for the water wells and were based on vendor quotes and appropriate allowances. Costs for the electrical power to the wells are included in the site power discipline provided by KCA. Costs for the raw water system within the buildings and process facilities are included in the mechanical equipment and piping disciplines provided by NewFields.

21.2.14 THREE HILLS MINE BUILDINGS, LIGHTING, FIRE FIGHTING, SUPPORT EQUIPMENT

21.2.14.1 THREE HILLS MINE BUILDINGS

Process buildings in KCA's scope for Three Hills include the process workshop. Costs for the process workshop are based on steel building quotes and estimates for furnishings based on KCA's recent experience with similar installations. Costs for this building have been included in the project direct costs.

21.2.14.2 THREE HILLS MINE SUPPORT EQUIPMENT – MOBILE EQUIPMENT

The mobile equipment capital cost estimate is based primarily on cost guide information. The equipment prices include the cost of purchase, assembly/commissioning and some operator training. Transportation costs are included in the General Services costs.

Process mobile equipment for Three Hills includes the following:

- 1 ea. 40 ton mobile crane;
- 7 ea. ¾ ton pickup trucks;
- 2 ea. 2.5 ton forklifts;

- 1 ea. flatbed maintenance truck;
- 1 ea. 10 ton boom truck;
- 1 ea. backhoe;
- 1 ea. utility trailer; and
- 1 ea. all-terrain forklift (telehandler).

21.2.14.3 THREE HILLS MINE SUPPORT EQUIPMENT –COMMUNICATIONS

A lump sum allowance for communications in the form of telephones, radios, and cell phones has been made based on recent experience of similar operations.

21.3 THREE HILLS MINE INDIRECT CAPITAL COSTS

Indirect capital costs include costs for items such as equipment rentals, temporary construction facilities, construction quality assurance/quality control and construction surveying, and consumables such as fuel, power, and security. The costs have been estimated based on experience with recent, similar projects. For the facilities included in the NewFields scope of work, these costs are presented as a percentage of the capital costs for each facility/area. These vary between 3.5% and 8.0%.

21.3.1 THREE HILLS MINE SPARE PARTS

Spare parts costs for items in KCA's scope were estimated at approximately 5% of the mechanical equipment supply. Spare parts costs provided or recommended by the supplier were used when available. Spare part costs cover all classes of spare parts.

21.3.2 THREE HILLS MINE INITIAL FILLS INVENTORY

The initial fills consist of consumable items stored on site at the commencement of operations. This inventory of initial fills is in place to ensure that adequate consumables are available for the first stage of operation. Details of the initial fills are presented in Table 21-7. Note that $146,000 of the initial fills occurs in year -1 and is categorized as initial capital. The remaining $146,000 of initial fills occurs in month 1 of production and is thus categorized as growth capital.

Table 21-7 Initial Fills – Three Hills Mine

Item	Basis	Needed Weight (lb or gal)	Truck Loads	Quantity to Order (lb or gal)	Unit Price US$	Tax, Duty 6.85%	Shipping 6%	Total Cost US$ (1,000)
NaCN (30%)	Full Tank			8,339	1.69	0.12		$ 15
Pebble Lime	Full Silo	200,000		200,000	0.12	0.01		$ 26
Carbon	Full Circuit + Extra	94,031		94,031	1.46	0.10		$ 147
Antiscalant	4 weeks			1920	24.64	1.69		$ 51
LNG (DGE)	Full Tank	20,000		20,000	4.60	0.32	incl	$ 98
Lab Consumables	Allowance			1	$ 25,000.00	1,713	1,500	$ 28
Lab Supplies, Process	Allowance			1	$ 50,000.00	3,425	3,000	$ 56
TOTAL								$ 422

21.3.3 THREE HILLS MINE ENGINEERING, PROCUREMENT AND CONSTRUCTION MANAGEMENT

The EPCM cost for the processing facility at Three Hills is factored from the direct costs for the plant. A factor of 3% was used for items that were bid as turnkey and a factor of 10% was used on all other items. NewFields has estimated the engineering, procurement and construction management costs for the HLF, event pond, site infrastructure and roads as a percentage of the capital costs. These percentages are based upon recent, similar, experience and vary by facility/area. The engineering varies between 1.5% and 10% and it largely based upon the level of design that exists at each facility. The construction management/procurement is estimated to be between 3% and 3.5% of the capital costs.

21.3.4 THREE HILLS MINE CONTINGENCY

KCA has estimated the contingency for the processing facility at Three Hills to be $3,000,000. The contingency for the processing facility was estimated as a percentage of the direct and indirect capital costs by discipline. Based on the level of detail incorporated into the engineering performed to date on the site infrastructure, NewFields recommends using a 20% contingency on the roads, Event Pond and site facilities and a 30% contingency on the water supply system. The HLF engineering has been advanced farther than the other components designed by NewFields and the contingency for this facility is recommended to be 15%. Furthermore, a 50% contingency has been used for well installation.

21.3.5 THREE HILLS MINE SUSTAINING CAPITAL

Due to the short mine life of approximately two (2) years, there is no sustaining capital for the Three Hills operation.

21.3.5.1 THREE HILLS MINE EXCLUSIONS

The following capital costs have been excluded from the scope of the process capital estimate for Three Hills:

- Finance charges and interest during construction;
- Escalation costs; and
- Currency exchange fluctuations.

21.4 HASBROUCK MINE PROCESS CAPITAL COSTS

Capital expenditures for items in KCA's scope for the Hasbrouck Mine are summarized by area in Table 21-8. Capital costs have been based on the design presented in Section 17.0 and are considered to have an accuracy of +/-20%. Process capital costs for the Hasbrouck Mine (excluding the heap-leach facility) are estimated to be $86.1 million (including indirects, contingencies, initial fills, and EPCM, but excluding working capital).

Capital costs have been estimated by KCA and NewFields. Equipment and material requirements and specifications are described in previous sections of this study. Capital cost estimates have been made primarily using budgetary supplier quotes for all major and most minor equipment items. All equipment is assumed to be purchased new. Where supplier quotes were not available for minor items, a reasonable cost estimate has been made based on supplier quotes in KCA's files. All costs are in fourth quarter 2022 US Dollars.

The capital costs are summarized by discipline in Table 21-9.

Each area in the Hasbrouck Mine process cost build-up is separated into the following disciplines, as applicable:

- Earthworks;
- Civils and foundations;
- Structural steel;
- Platework;
- Mechanical equipment;
- Piping, Electrical and Instrumentation;
- Installation and Commissioning;
- Freight; and
- Sales and Other Taxes.

NewField's scope of work included costs for the construction of the leach pad and ponds, liner, and gravity pipe. KCA's scope of work included all solution application equipment (pumps, tanks, etc.), pressure piping, crushing, screening and agglomeration, reagent storage, power supply and distribution, water supply and some infrastructure.

Table 21-8 KCA Hasbrouck Mine Process Capital Costs by Area

Plant Totals Direct Costs	Total Supply Cost	Install	Grand Total
	US$	US$	US$
Area 0000 - Site & Utilities General	$137,590	$188,880	$326,470
Area 1403 - Laboratory (Shared w/ Three Hills)	$0	$0	$0
Area 4179 - Electrical	$8,237,399	$0	$8,237,399
Area 4290 - Mobile Equipment	$3,282,062	$0	$3,282,062
Area 4301 - Water Distribution	$1,069,781	$177,520	$1,247,301
Area 5004 - Primary Crushing	$4,888,195	$913,194	$5,801,389
Area 5023 - Secondary & Tertiary Crushing	$13,709,539	$1,800,926	$15,510,465
Area 5041 - Ore Reclaim & Stacking	$10,258,898	$1,397,200	$11,656,098
Area 5150 - Heap Leach & Solution Handling	$2,150,367	$508,758	$2,659,125
Area 5184 - Adsorption (Incl. Area 5150)	$2,738,842	$313,132	$3,051,973
Area 5184 - Acid Wash & Elution	$1,007,713	$579,840	$1,587,553
Area 5184 - Carbon Handling & Regeneration	$2,221,316	$144,720	$2,366,036
Area 5186 - Electrowinning & Refining	$2,582,464	$160,541	$2,743,005
Area 5188 - Detoxification	$0	$0	$0
Area 6051 - Reagents	$343,120	$68,212	$411,332
Ancillaries	$415,510	$107,173	$522,683
Plant Total Direct Costs	$53,042,795	$6,360,095	$59,402,891
Sales Tax & Other Taxes	$2,524,351		$2,524,351
Spare Parts	$2,652,140		$2,652,140
Sub Total with Spare Parts			$64,579,382
Contingency	$12,240,000		$12,240,000
Plant Total Direct Costs with Contingency			$76,819,382
Indirect Field Costs			$1,790,000
Initial Fills			$258,986
Sub Total Plant Cost Before EPCM			$78,868,367
EPCM			$7,225,000
TOTAL Pre-Production Capital Cost			$86,093,367
Working Capital (90 days)			$7,427,758
Total Attached Power (kW)			7,516

Table 21-9 KCA Hasbrouck Mine Process Capital Costs by Discipline

Discipline	Cost @ Source	Freight	Total Supply Cost	Sales & Other Taxes	Install	Grand Total
	US$	US$	US$	US$	US$	US$
Major Earthworks		$0	$0	$0	$824,200	$824,200
Liner, GCL & Miscellaneous		$0	$0	$0	$0	$0
Civils (Supply & Install)		$0	$4,556,511	$156,061	$0	$4,712,572
Structural Steelwork (Supply & Install)		$0	$888,578	$30,434	$386,718	$1,305,730
Platework (Supply & Install)		$254,947	$2,754,074	$131,473	$0	$2,885,548
Mechanical Equipment		$1,508,266	$26,886,375	$1,735,637	$3,512,078	$32,134,091
Piping		$44,421	$2,388,802	$160,590	$561,040	$3,110,432
Electrical		$0	$13,186,011	$272,638	$823,440	$14,282,089
Instrumentation		$0	$461,813	$23,161	$175,440	$660,414
Facilities		$9,098	$1,920,630	$14,357	$77,179	$2,012,166
Spare Parts		--	$2,652,140	--	--	$2,652,140
Contingency		--	$12,240,000	--	--	$12,240,000
Plant Total Direct Costs	$0	$1,816,732	$67,934,935	$2,524,351	$6,360,095	$76,819,382

The earthworks quantities have been based on quantities estimated by KCA for the following tasks:

- Topsoil stripping (12 in depth);
- Material cut to fill; and
- Material placement and compaction (including 1-mile haul).

Unit costs for the above activities were provided to KCA by NewFields and budgetary quotes provided by material vendors.

The site earthworks include site access roads, general site grading at the buildings and other facilities around the plant site, and the explosives storage magazine road. The earthworks costs include shaping and grading, road wearing coarse, and any drainage components required to control and convey storm water runoff. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CostMine handbook, and budgetary quotes provided by material vendors.

Hasbrouck Mine capital costs estimated by NewFields include the heap-leach facility, event ponds and associated infrastructure, water supply, and access roads. These capital costs estimates are shown in Table 21-10.

Table 21-10 NewFields Estimated Capital for Hasbrouck Mine (K USD)

NewFields Estimated Capital Costs	Hasbrouck Year 2	Hasbrouck Year 4	Hasbrouck Total
Roads	$ 1,501	$ -	$ 1,501
Heap Leach Facility	$ 14,713	$ 13,613	$ 28,326
Event Ponds & Site Infrastructure	$ 4,981	$ -	$ 4,981
Water Supply	$ 5,895	$ -	$ 5,895
Total	**$ 27,091**	**$ 13,613**	**$ 40,703**
Indirects	$ 1,309	$ 613	$ 1,922
EPCM	$ 2,064	$ 749	$ 2,812
Contingency	$ 6,487	$ 3,403	$ 9,890
Total Estimated by NewFields	**$ 36,950**	**$ 18,377**	**$ 55,327**

21.4.1 HASBROUCK MINE HLF AND EVENT PONDS

The HLF includes the earthworks, HDPE geomembrane, gravity drain piping and gravel overliner materials within the leach pad. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

The event pond includes the earthworks, HDPE geomembrane, and miscellaneous piping. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.4.2 HASBROUCK MINE CIVILS AND FOUNDATIONS

Civils include detailed earthworks, concrete and the retaining wall for the primary crusher. Civils in KCA's scope include concrete for the crushing area, concrete for the pug mill slab foundation, concrete sleepers for the overland conveyors, the foundation for the ADR plant and refinery, concrete for the site substations, and a concrete slab for the process workshop. Concrete quantities estimated by KCA are based on similar installations, major equipment weights and on slab areas. Concrete costs have been estimated by KCA based on supplier quotes from recent projects completed by KCA in the area. These costs include all form work, footing excavation, concrete supply, rebar, and curing costs. The cost for a Hilfiker-type retaining wall at the primary crusher was based on supplier quotes from recent projects.

21.4.3 HASBROUCK MINE STRUCTURAL STEEL

Structural steel, including steel grating, structural steel, and handrails has been estimated based layout drawings and equipment loads. Table 21-11 shows the unit rates for structural steel. These costs are estimated based on KCA's in-house structural steel costs.

Table 21-11 Structural Steel Unit Rates

Description	Unit	Unit Cost (USD)
Grating	ft^2	$ 21.55
Structural Steel	lb	$ 2.27
Handrails	ft	$17.68

21.4.4 HASBROUCK MINE PLATEWORK

The plate-work discipline includes costs for the supply and installation of steel tanks, bins, and chutes. Plate-work costs for the crushing plant have been primarily included in the vendor supply package with some items estimated by KCA based on experience with similar sized projects. Plate-work costs for the HPGR feed bin were based on the weight of steel required by the design. The plate-work costs for the pregnant tank, barren tank and adsorption columns were included in the quote for the adsorption circuit from KCA.

21.4.5 HASBROUCK MINE MECHANICAL EQUIPMENT

Costs for mechanical equipment are based on an equipment list developed of all major equipment for the processing facility. Costs for most major items of new equipment are based on budgetary quotes from vendors. Costs for minor equipment items are based on supplier quotes or KCA's in-house database, or else reasonable allowances were made for the equipment.

Installation hourly costs for mechanical equipment were factored based on the equipment supply cost and include installation labor and equipment usage.

21.4.6 HASBROUCK MINE PIPING, ELECTRICAL AND INSTRUMENTATION

Major piping costs, including process solution piping, fire water piping and heap irrigation, are based on estimated material takeoffs and supplier quotes. Additional ancillary piping, fittings, and valve costs have been estimated on a percentage basis of the mechanical equipment costs. Varying factors ranging up to 25% of the mechanical equipment supply were used to estimate the ancillary piping purchase costs for each area.

Electrical costs for the project are primarily based on supplier quotes based on material takeoffs and information developed by KCA. These include the site distribution power lines and transformers. Delivery of power to the site has been quoted by NV energy. Varying factors ranging up to 19% of the mechanical equipment supply were used to estimate the miscellaneous electrical costs for each process area.

Varying factors ranging up to 5% of the mechanical equipment supply were used to estimate the instrumentation costs. Allowances of $5,000 and $50,000 have been included for the water supply valves and site security system, respectively. Minimal instrumentation is planned for the Hasbrouck Mine.

21.4.7 HASBROUCK MINE INSTALLATION

Installation costs have been included for all items in KCA's equipment supply package. Installation estimates for all other items are based on a sliding scale factored from the supply cost and include all installation labor and equipment usage. The hourly installation labor rates are estimated to be $80.00/hr and include provisions for wages, burdens, overhead and contractor profit. The estimated unit cost is based on information in KCA's database and recent cost guide data.

21.4.8 HASBROUCK MINE FREIGHT

Estimates for equipment freight costs are based on loads as bulk freight at an average percentage of equipment cost. The cost for transport of equipment items to the jobsite in Tonopah, Nevada is estimated to average 6% of the equipment cost.

Where applicable, supplier quoted freight cost estimates for equipment packages are used in place of the freight estimate. Freight costs have been included in KCA's equipment supply package.

21.4.9 HASBROUCK SALES MINE TAX AND OTHER TAXES

Nevada sales tax in Esmeralda County has been applied to all material supply costs for the Hasbrouck Mine. Sales tax was applied to 50% of the value of any allowance that did not have a breakdown between supply and install costs. The effective sales tax in Esmeralda County as of the Effective Date of this report is 6.850%.

21.4.10 HASBROUCK MINE POWER SUPPLY AND DISTRIBUTION CAPITAL COSTS

Capital costs for the infrastructure involved in the supply of grid power to the Hasbrouck Mine have been provided by NV Energy. Grid power will be delivered to a mine substation from a 120 kV switching station to be constructed 2 miles to the north. NV Energy's cost study includes permitting review, new transmission line to the project site, a new 120 kV switching station, and installation of communications at the switching station.

Costs for power distribution onsite have been estimated by Jensen Engineering and include the site distribution power lines, switchgear, and transformers. Costs for the site power distribution are included in the project direct costs.

A 750 kW backup generator has been included in the cost estimate to provide power to the critical pumping systems and facilities in the event of a power outage.

21.4.11 HASBROUCK MINE WATER CAPITAL COSTS

The Hasbrouck Mine raw water will be sourced from two groundwater wells to be installed near Three Hills Mine. The capital costs for the Hasbrouck Mine raw water system include the overland pipeline from the Three Hills Mine 500,000-gallon water storage tank to the Hasbrouck Mine water storage tank and from there to the raw and fire water distribution pipelines at and around the mine. The capital costs also include the 500,000-gallon water storage tank located west of the mine.

Costs for the raw water system within the buildings and process facilities are included in the mechanical equipment and piping disciplines. NewFields has estimated the costs of the well, pump, pipeline, water storage tank and delivery system. These costs were derived from quantity take-offs from the design drawings and estimated labor and equipment rates based upon recent, similar, project experience and vendor quotes.

21.4.12 HASBROUCK MINE BUILDINGS, LIGHTING, FIRE FIGHTING, SUPPORT EQUIPMENT CAPITAL COSTS

21.4.12.1 HASBROUCK MINE BUILDINGS

KCA's scope included the process warehouse and workshop building, ADR building and reagent storage building for the Hasbrouck Mine. The cost for the building is based on a steel building quote and an estimate for furnishings based on KCA's experience with similar installations. Costs for the workshop building have been included in the project direct costs. Costs for the ADR and refinery buildings were included in the supplier quote package.

21.4.12.2 HASBROUCK MINE FIRE FIGHTING

A raw water tank is included in the design which will have a Mineral Reserve capacity for use as fire water. Fire water will be delivered by a gravity system.

Costs for the fire water systems within the buildings and facilities are included in the mechanical equipment and plate-work disciplines. Costs for the water delivery pipeline are included with the water supply capital costs.

21.4.12.3 HASBROUCK MINE MOBILE EQUIPMENT

The majority of mobile equipment for the Hasbrouck Mine will be shared with or transferred from Three Hills Mine. Mobile equipment includes a 40-ton crane, a boom truck, flatbed maintenance truck, light vehicles, two indoor forklifts, a backhoe, and an all-terrain forklift. The additional mobile equipment needed for Hasbrouck includes a Cat D6 Dozer, a Cat 992 front end loader, three 2.5-ton forklifts, and three pickups.

21.5 HASBROUCK MINE INDIRECT CAPITAL COSTS

Indirect capital costs include costs for items such as equipment rentals, temporary construction facilities, construction quality assurance/quality control and construction surveying, and consumables such as fuel and power, and security. These costs have been estimated based on experience with recent, similar projects. NewFields has estimated these costs as a percentage of the capital costs for each facility/area. These vary between 3.5% and 6.3%.

21.5.1 HASBROUCK MINE SPARE PARTS

Spare parts costs for items in KCA's scope were estimated at approximately 5% of the mechanical equipment supply. Where available, costs for spare parts were provided or recommended by the supplier.

21.5.2 HASBROUCK MINE INITIAL FILLS INVENTORY

Initial fills consist of consumable items to be stored on site at the outset of operations; this includes sodium cyanide, cement for pH control and agglomeration, carbon, anti-scalant, and diesel fuel. The Hasbrouck Mine initial fills also include a spare set of rolls for the HPGR. This inventory of initial fills is to ensure that adequate consumables are available for the first stage of operation. Details of the initial fills are presented in Table 21-12.

Table 21-12 Hasbrouck Mine Initial Fills

Item	Basis	Needed Weight	Truck Loads	Quantity to Order	Unit Price	Tax, Duty	Shipping	Total Cost
		lb or gal		lb or gal	US$	6.85%	6%	US$ (1,000)
NaCN	Full Tank		-	8,339	1.69	0.12		$ 15
Cement	Full Silo	200,000	10.0	200,000	0.07	0.01		$ 16
Carbon	Full Circuit + 7tn	84,000		84,000	1.46	0.10		$ 131
Antiscalant	4 weeks		-	1,920	24.64	1.69		$ 51
Caustic Soda	4 weeks	15,480		15,480	1.05	0.07		$ 17.4
Hydrochloric Acid	2 weeks	1,708		1,680	3.40	0.23		$ 6.11
Diesel (gal)	Total Fill	1,800	0.1	1,800	4.00	0.27		$ 7.7
Flux, lb	2 weeks							
SiO2				2,000	0.90	0.06		$ 1.92
Borax				2,000	1.59	0.11		$ 3.40
Niter				1,000	1.35	0.09		$ 1.44
Soda Ash				1,000	0.61	0.04		$ 0.65
Foam	2 weeks							$ 8.2
TOTAL								$ 259

21.5.3 HASBROUCK MINE ENGINEERING, PROCUREMENT AND CONSTRUCTION MANAGEMENT

The EPCM cost for the processing facility at Hasbrouck is factored from the direct costs for the plant. A factor of 3% was used for items that were bid as turnkey and a factor of 10% was used on all other items. NewFields has estimated the engineering, procurement and construction management costs for the HLF, event pond, site infrastructure and roads as a percentage of the capital costs. These percentages are based upon recent, similar, experience and vary by facility/area. The engineering costs include site geotechnical investigations and other studies required to support advancing the current facilities through detailed engineering. The engineering cost varies between 2.5% and 15% of the facility capital cost and it is largely based upon the level of design that currently exists at each facility. The construction management/procurement is estimated to be between 3% and 3.5% of the capital costs.

21.5.4 HASBROUCK MINE CONTINGENCY

The contingency for the processing facility at Hasbrouck is $12,240,000, or 20% of the direct and indirect capital costs. Based on the level of detail incorporated into the engineering performed to date on the site infrastructure, NewFields recommends using a 25% contingency on the roads and the HLF, and 30% on the water supply system. A 20% contingency is recommended for the event pond and site facilities.

21.5.5 HASBROUCK MINE SUSTAINING CAPITAL

Sustaining capital in KCA's scope of work includes an additional overland conveyor and barren solution header pipe to the heap. The total estimated cost for these items is $1,000,000.

Phase 2 of the HLF has been included as sustaining capital. The HLF Phase 2 includes the earthworks, HDPE geomembrane, gravity drain piping and gravel overliner materials within the leach pad expansion area. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CostMine handbook, and budgetary quotes provided by material vendors.

21.5.5.1 HASBROUCK MINE EXCLUSIONS

The following capital costs have been excluded from the scope of supply and estimate:

/ Finance charges and interest during construction;

/ Escalation costs; and

/ Currency exchange fluctuations.

21.6 OTHER CAPITAL COSTS

RESPEC estimated other capital costs for light vehicles, site and administration, safety and security, and owners capital with input from vendors and WVM.

Administration capital costs are shown in Table 21-13 and in Year -1 assume that the main administration office would be in the town of Tonopah. During Year 2, the main administration office would be in a double- to triple- wide office trailer that will be installed at the Hasbrouck Mine and will remain there for the LOM.

Table 21-13 Administration Capital

Site and Administration	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Total
Administration Building	K USD	$ -	$ -	$ 77	$ -	$ 77
Computers, Printers, and Plotters	K USD	$ 45	$ -	$ -	$ -	$ 45
Communications (phones, internet, etc)	K USD	$ 2	$ -	$ -	$ -	$ 2
Site and Administration Total	K USD	$ 47	$ -	$ 77	$ -	$ 124

Safety and security capital costs are shown in Table 21-14. This includes a used double wide trailer for offices and a training room, as well as furnishings, office network supplies, an allocation for communications, and initial safety supplies. Additional safety supplies and equipment costs are estimated for Year 2 and Year 3 when operations commence at Hasbrouck.

Table 21-14 Safety and Security Capital Costs

Safety and Security	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Total
Safety and Training Building	K USD	$ 40	$ -	$ -	$ -	$ -	$ 40
Computers, Printers, and Plotters	K USD	$ 15	$ -	$ -	$ -	$ -	$ 15
Communications (phones, internet, etc)	K USD	$ 2	$ -	$ -	$ -	$ -	$ 2
Initial Safety Supplies and Equipment	K USD	$ 25	$ -	$ 5	$ 10	$ -	$ 40
Total Safety and Security	K USD	$ 82	$ -	$ 5	$ 10	$ -	$ 97

Site security fencing is included within the event pond and facilities costing prepared by NewFields. Material quantity take-offs were calculated from engineering design drawings with unit rates being derived from recent, similar, projects.

Owner's capital costs were developed using inputs from WVM and are shown in Table Table 21-15 These include the land acquisition cost to complete the lease-purchase agreement with Eastfield, as described in Section 4.3. Feasibility study costs for the Hasbrouck Project are assumed to occur prior to the start of construction and are not included in the construction costs. However, these costs are shown in the Recommendations (Section 26). In addition, some permitting costs for base line studies at the Hasbrouck Mine are also expected to occur prior to construction of the Hasbrouck Mine and are also included in the Recommendations (Section 26).

Bonding costs are assumed to be covered in part at commencement of construction and fully in Year 2 using surety bonds as discussed at the start of Section 21.7. Prior to demonstrating an operating history, the surety bond will be possible for only half of the bonding required. A bonding cost of $2,279,000 has been included in owner's capital, which is two thirds of the predicted bonding amount. The balance is to be covered by a surety bond. The cost to maintain the surety bonding has been included in general and administrative operating costs. Once WVM switches to a surety bond for all bonding costs at the end of Year 2, it is assumed that the cash provided as the initial Three Hills bond will be released.

Fiber optic lines, power generation at Three Hills, and offsite electrical supply costs for Hasbrouck are based on vendor quotations. Note that onsite electrical distribution has been estimated by KCA and are included in the process capital estimate. Power generation at Three Hills assumes leasing of an LNG fuel station and a generator. Capital costs include a charge every two years to swap out the generator for major overhauls.

Table 21-15. Owner's Capital Costs

Owners Capital	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Total
Three Hills Reclamation	K USD	$ 1,385	$ 103	$ 103	$ 2,241	$ 2,241	$ 2,241	$ (1,283)	$ -	$ -	$ -	$ -	$ -	$ 7,030
Hasbrouck Reclamation	K USD	$ -	$ 1,603	$ 119	$ 119	$ 119	$ 119	$ 119	$ 119	$ 1,562	$ 2,592	$ 2,592	$ (295)	$ 8,766
Owners Workforce	K USD	$ 479	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 479
Project Controls	K USD	$ 388	$ 97	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 486
G&A During Pre-Production	K USD	$ 2,588	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,588
Total Owners Capital	K USD	$ 6,247	$ 1,802	$ 221	$ 2,359	$ 2,359	$ 2,359	$ (1,164)	$ 119	$ 1,562	$ 2,592	$ 2,592	$ (295)	$ 20,754

Light vehicle costs were estimated by RESPEC and are shown in Table 21-16. These costs are based on the number of vehicles required for each department and vendor quotations. KCA estimated the number of vehicles required for processing personnel. Taxes and fleet purchase discounts are included.

Table 21-16 Light Vehicles

Light Vehicles	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
Mining	K USD	$ 202	$ -	$ -	$ -	$ -	$ 152	$ -	$ 354
Processing	K USD	$ 332	$ -	$ 160	$ -	$ -	$ 110	$ -	$ 602
Administration	K USD	$ 178	$ -	$ -	$ -	$ -	$ 229	$ -	$ 407
Total	K USD	$ 712	$ -	$ 160	$ -	$ -	$ 490	$ -	$ 1,363

21.7 MINE OPERATING COSTS

Mine operating costs were based on contractor quotations along with mine owner's operating mining costs to manage the contractor and ore control. Contractor quotes were given based on a production schedule provided to the contractor and broken into components of $/ton for ore and waste separately which varied by year based on the pit positions provided to the contractor. Additional costs were provided by the contractor for initial mining ("pioneer mining") as well as mobilization and demobilization. The mobilization and demobilization costs were included in the capital cost estimate.

Rehandle costs were also estimated by the contractor based on the production schedule rehandle of Hasbrouck material to the crusher. Note that since Three Hills processing is based on ROM leaching, no rehandle is assumed for Three Hills.

The contractor mining cost is based on a $3.25 per gallon fuel costs. The resulting contractor costs are shown in Table 21-17. Total contractor mining cost is estimated to be $1.80/ton based on the contractor quotations. Owner's operating mining costs were estimated by RESPEC based on the personnel and supplies required to achieve the mine production schedule. These costs include mining supervision, engineering and geology requirements, light vehicles, and outside services which total $0.15/ton bringing the total cost per ton to $1.95/ton or $1.99/ton with the inclusion of rehandle costs.

Table 21-17 Mining Cost Summary

Mining Cost Summary	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Mine General Service	K USD	$ 473	$ 625	$ 625	$ 628	$ 625	$ 625	$ 625	$ 625	$ 261	$ -	$ 5,113
Engineering	K USD	$ 300	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	$ 167	$ -	$ 3,269
Geology	K USD	$ 324	$ 663	$ 663	$ 663	$ 663	$ 663	$ 663	$ 663	$ 276	$ -	$ 5,241
Contract Mining Cost	K USD	$ 3,096	$ 21,221	$ 17,444	$ 27,991	$ 13,354	$ 19,212	$ 20,519	$ 24,484	$ 20,412	$ -	$ 167,733
Total Mining Cost	K USD	$ 4,194	$ 22,909	$ 19,132	$ 29,683	$ 15,043	$ 20,900	$ 22,208	$ 26,173	$ 21,116	$ -	$ 181,357
Contract Rehandle	K USD	$ -	$ -	$ -	$ 734	$ 796	$ 793	$ 796	$ 798	$ 293	$ -	$ 4,210
Total Mining Cost w/ Rehandle	K USD	$ 4,194	$ 22,909	$ 19,132	$ 30,417	$ 15,839	$ 21,693	$ 23,003	$ 26,971	$ 21,409	$ -	$ 185,567
Cost per Ton Mined												
Mine General Service	$/ton	$ 0.31	$ 0.06	$ 0.06	$ 0.04	$ 0.06	$ 0.06	$ 0.04	$ 0.04	$ 0.07	$ -	$ 0.05
Engineering	$/ton	$ 0.20	$ 0.04	$ 0.04	$ 0.02	$ 0.04	$ 0.04	$ 0.03	$ 0.03	$ 0.05	$ -	$ 0.04
Geology	$/ton	$ 0.22	$ 0.07	$ 0.06	$ 0.04	$ 0.07	$ 0.07	$ 0.04	$ 0.04	$ 0.08	$ -	$ 0.06
Contract Mining Cost	$/ton	$ 2.06	$ 2.08	$ 1.68	$ 1.64	$ 1.37	$ 1.90	$ 1.37	$ 1.58	$ 5.58	$ -	$ 1.80
Total Mining Cost	$/ton	$ 2.78	$ 2.25	$ 1.84	$ 1.74	$ 1.54	$ 2.07	$ 1.48	$ 1.69	$ 5.78	$ -	$ 1.95
Total Rehandle by Contractor	$/ton	$ -	$ -	$ -	$ 0.04	$ 0.08	$ 0.08	$ 0.05	$ 0.05	$ 0.08	$ -	$ 0.05
Total Mining Cost w/ Rehandle	$/ton	$ 2.78	$ 2.25	$ 1.84	$ 1.78	$ 1.63	$ 2.15	$ 1.53	$ 1.74	$ 5.86	$ -	$ 1.99

21.8 PROCESS OPERATING COSTS

The estimated annual process operating cost for Three Hills Mine is $2.98 per ton of ore processed; after allocation of fixed costs through the rinsing of leach pads the LOM cost is $3.38 per ton of ore. The estimated first year process operating cost for the Hasbrouck Mine is $4.58 per ton of ore processed and the remaining LOM process annual operating cost is $4.82 per ton of ore processed. After allocation of fixed costs through the rinsing of leach pads the Hasbrouck Mine LOM cost is $5.04 per ton of ore. Sales tax has not been included in the operating cost estimate.

21.8.1 THREE HILLS MINE PROCESS AND SUPPORT SERVICES OPERATING COSTS

Process operating cost requirements for Three Hills were estimated by KCA based upon unit consumption, and, where possible, have been broken down by area. The annual operating costs for the process, laboratory, and service and support were estimated by KCA to be $2.89 per ton of ore, not including costs for make-up water supply. RESPEC applied these costs using fixed and variable portions through the LOM, which includes final rinsing of the leach pad at the end of processing. The resulting LOM processing cost for Three Hills is $3.33 per ton of ore.

Process operating costs for the project have been estimated from first principles. Labor costs were estimated using project-specific staffing, salary, wage, and benefit requirements. Unit consumption of materials, supplies, power, water, and delivered supply costs were also estimated.

The process operating costs are based upon ownership of all process production equipment and site facilities (some mobile equipment including a dozer for the heap leach to be supplied by the mining contractor), except for desorption and recovery equipment, which will be the responsibility of a contractor for toll stripping. The costs are based on the Owner employing and directing all operating, maintenance, and support personnel.

The process operating costs have been estimated without contingency allowances and are considered to have an accuracy range of +/- 20%.

Operating costs estimates have been based upon information obtained from the following sources:

- Project metallurgical tests and process engineering;
- Budgetary quotations from potential suppliers of project operating and maintenance supplies and materials;
- Recent KCA project file data; and
- Experience of KCA staff with other similar operations.

Where specific data do not exist, cost allowances have been based upon consumption and operating data from other similar properties for which reliable data exists. Freight costs have been estimated where delivered prices were not available.

All operating costs are presented in 4th quarter 2022 US dollars. These operating costs do not include Nevada sales tax.

Table 21-18 shows the process and support services operating costs by area.

Table 21-18 Three Hills Mine Process and Support Operating Costs

	Units	Qty	Unit Costs, US$	Annual Costs, US$	US$ per Ton Ore
Labor					
Process	ea	24		$2,772,200	$0.506
Lab	ea	9		$958,500	$0.175
SUBTOTAL				$3,730,700	$0.681
Water Supply & Distribution					
Supply	gal/d	440,000			$0.00
Power	kWh/ton	0.06	$0.00	$0	$0.00
Maintenance Supplies	lot			$50,000	$0.009
SUBTOTAL				$445,284	$0.08
Heap-Leach-Pad & Ponds					
Power	kWh/ton	0.75	$0.00	$0	$0.00
Piping	lot			$219,000	$0.04
Pad Gravel (haul and spread only)	t	-	$2.00		
Maintenance Supplies	lot			$50,000	$0.009
Dozer (supplied by mining contractor)					
SUBTOTAL				$269,000	$0.049

	Units	Qty	Unit Costs, US$	Annual Costs, US$	US$ per Ton Ore
Adsorption					
Power	kWh/ton	0.001	$0.000	$0	$0.00
Misc. Operating Supplies	lot			$100,000	$0.018
Maintenance Supplies	lot			$100,000	$0.018
SUBTOTAL				$200,000	$0.037
Recovery					
Power	kWh/ton	0.000	$0.00	$0	$0.00
Carbon Transportation Cost	US$/ton	478	$409.07	$195,331	$0.036
Toll-Stripping	ton/mo, dry	39.8	$1,600.00	$763,968	$0.14
Safety Supplies	lot			$25,000	$0.005
Diesel Fuel	gal/day	0.0	$3.25	$0	$0.00
SUBTOTAL				$984,299	$0.18
Reagents					
Power	kWh/ton	0.001	$0.000	$0	$0.000
Cyanide (Ore Consumption)	lb/ton	0.45	$1.69	$4,163,738	$0.761
Carbon	lb/mo	22031	$1.46	$385,983	$0.070
Lime	lb/ton	4	$0.12	$2,693,700	$0.492
Anti-Scalant	gal/day	65.0	$24.64	$576,670	$0.105
Safety Supplies	lot			$50,000	$0.009
Misc. Operating Supplies	lot			$30,000	$0.005
Maintenance Supplies	lot			$50,000	$0.009
Liquified Natural Gas (LNG)	DGE/day	369	$4.60	$635,703	$0.116
SUBTOTAL				$8,585,794	$1.568
	Units	Qty	Unit Costs, US$	Annual Costs, US$	US$ per Ton Ore
Laboratory (At Tonopah)					
Power	kWh/ton	0.16	$0.102	$87,313	$0.016
Assays, Solids	No./day	100	$7.00	$252,000	$0.046
Assays, Solutions	No./day	100	$3.00	$108,000	$0.020
Carbon Assay	No./day	5	$7.00	$12,600	$0.002
Consumables	Per Year			$50,000	$0.009

	Units	Qty	Unit Costs, US$	Annual Costs, US$	US$ per Ton Ore
SUBTOTAL				$509,913	$0.093
Mobile Equipment / Support Services					
Power	kWh/ton	0.01	$0.000	$0	$0.000
Maintenance Supplies	lot			$10,000	$0.002
Fork lift	hr/d	12	$8.90	$38,448	$0.007
Maintenance Trucks	hr/d	12	$59.50	$257,040	$0.047
Crane (40-t)	hr/month	4	$102.01	$4,896	$0.001
Boom Truck 10 ton crane	hr/d	6	$57.96	$125,194	$0.023
Telehandler	hr/d	4	$27.01	$38,894	$0.007
Back Hoe	hr/d	4	$28.15	$40,536	$0.007
Pick Ups	hr/d	40	$32.61	$469,584	$0.086
Generator Rental – 1300kW LNG Package	month	1	$62,171.47	$746,058	$0.136
Generator Rental – 750kW LNG Package	month	1	$21,941.06	$263,293	$0.048
SUBTOTAL				$1,993,943	$0.364
TOTAL COST (Excluding Sales Tax)				$16,323,649	$2.981

21.8.1.1 THREE HILLS MINE PROCESS PERSONNEL AND STAFFING

Staffing requirements, wage and salary for process and administration have been estimated by KCA. Burden information for personnel was provided by WVM and has been included in the wage and salary data. Staffing levels, wages, and wage burdens of several operating mines in the area have been reviewed by management and found to accurately reflect current costs.

The work force will consist of approximately 24 persons in the process areas and 9 persons in the laboratory. Yearly staffing costs are estimated at $2,772,000 for the process area and $959,000 for the laboratory.

21.8.1.2 THREE HILLS MINE POWER

Power usage for the process and process-related infrastructure was derived from estimated connected loads assigned to powered equipment from the mechanical equipment list. Equipment power demands under normal operation were assigned and coupled with estimated on-stream times to determine the average energy usage and cost.

The total attached power for the process and infrastructure is estimated at 1.6 MW, with an average draw of 0.7 MW. Additionally, the laboratory in Tonopah will have an attached power of 0.23 MW with an average power draw of 0.1 MW. The total consumed power for these areas is estimated at approximately 0.9 kWh/ton ore. Power generation costs, based on a quote from Aggreko, are estimated to be $0.30/kWh. Power costs for the laboratory are $0.102 based on a quote from NV Energy. Emergency power will be provided by an onsite generator.

Power requirements are presented in Table 21-19.

Table 21-19 Three Hills Mine Process Power and Consumption

Area / Description	Attached Power (kW)	Average Demand (kW)
Area 4301 - Water Supply & Distribution	227	162
Area 5150 – Heap Leach & Solution Handling	1130	505
Area 5184 - Adsorption	5	4
Area 6051 - Reagents	4	5
Area 1403 - Laboratory	234	113
Ancillaries	30	17
Total	1630	691

21.8.1.3 THREE HILLS MINE CONSUMABLE ITEMS

Operating supplies costs have been estimated based upon unit costs and consumption rates predicted by metallurgical tests, and have been broken down by area. Freight costs have been included. Reagent consumptions have been derived from test work and from the Design Criteria. Other costs have been estimated from past KCA experience with similar operations. Consumable quantities are summarized in Table 21-20.

Table 21-20 Three Hills Process Consumable Items

Item	Form	Storage Capacity	Annual Consumption
Lime	Bulk	150 tons	10,950 tons
Sodium Cyanide (30%)	30% Liquid, Delivered	12.3 tons	1,232 tons
Activated Carbon	1,100 lb super sack	22 tons + Columns	132 tons
Antiscalant	Liquid Tote, 240 gal bins	8 totes (1,920 gal)	23,400 gal

Operating costs for these items have been distributed based on tonnage and gold production, or smelting batches, as appropriate.

Three Hills Mine Heap-Leach Consumables

Pipes, Fittings and Emitters – The heap pipe costs include expenses for broken pipe, fittings and valves, and abandoned tubing. The heap pipe costs are estimated to be $0.04/ton of ore and are based on previous detailed studies conducted by KCA on similar projects.

Sodium Cyanide (NaCN) – Delivered sodium cyanide is quoted at $1.69/lb. Cyanide is consumed in the heap leach and ADR. Cyanide consumption for the heap is 0.45 lb/ton of ore.

Lime – Pebble lime is added to the heap at 4 lb/ton of ore for pH control based on metallurgical test work evaluations. A delivered price of $0.12/lb has been used based on a budgetary quotation.

Antiscale Agent (Scale Inhibitor) – Antiscalant consumption is based on an average dosage rate of 6 ppm to the suctions of the barren and pregnant pumps. A delivered price of $24.64/gal has been used based on a supplier quote.

Three Hills Mine Process Consumables

Carbon – Carbon will be used for the adsorption of gold from the pregnant solution and is estimated to be consumed at an average of 132 tons per year. Most of the carbon consumption is due to replacement of spent carbon due to toll stripping. It is assumed that carbon can be reused three times before activity levels are unacceptable. Carbon is quoted at $1.20/lb.

Costs for processing carbon by troll stripping are approximately $1,600 per dry ton, plus transportation costs. Based on recent discussions with a reputable toll stripping company, there is currently capacity at their facility to process 16 tons of carbon per month with 32 tons potentially available within the next few months. It is currently assumed in this cost estimate that all carbon loaded at Three Hills (approximately 40 tons per month) will be able to be processed by toll stripping despite current quoted capacities. It is possible to increase carbon processing by accepting higher tail loadings.

Transportation of carbon is estimated at $409 per dry ton of carbon.

21.8.1.4 THREE HILLS MINE LABORATORY

Fire assaying and solution assaying of samples will be conducted in a laboratory that will be located in Tonopah. It is estimated that each day approximately 100 solids assays at $7/assay, and 100 solutions assays at $3/assay, will be performed. The cost of an assay only includes supplies; the associated labor cost is included under Labor in the operating costs. Costs for renting the laboratory building in Tonopah are not included.

21.8.1.5 THREE HILLS MINE FUEL

The primary fuel source for the project will be diesel fuel and LNG. Diesel will be used by mobile equipment and the backup generator. Diesel price has been assumed to be $3.25/gal. LNG will be used in the main generator for power supply to Three Hills.

Fuel costs for mobile equipment have been included in the hourly operating costs for these units.

21.8.1.6 THREE HILLS MINE MOBILE EQUIPMENT

Numerous pieces of support equipment are required for the processing areas. The costs to operate and maintain this equipment have been estimated primarily using published information. Otherwise, allowances have been made based upon experience in similar operations.

Support equipment annual operating costs have been estimated to average $2,000,000 per year, or $0.36/ton of ore. Table 21-21 presents the support equipment operating costs.

Table 21-21 Support Equipment Operating Costs – Three Hills

	Units	Qty	Unit Costs, USD	Costs, USD	USD per Ton Ore
Maintenance Supplies	lot		$0	$10,000	$0.002
Fork lift	hr/d	12	$8.90	$49,378	$0.007
Maintenance Trucks	hr/d	12	$59.50	$52,661	$0.047
Crane (40-ton)	hr/month	4	$102.01	$1,427	$0.001
Boom Truck 10-ton crane	hr/d	6	$57.96	$50,112	$0.023
Telehandler	hr/d	4	$27.01	$28,800	$0.007
Back Hoe	hr/d	4	$28.15	$29,506	$0.007
Pick Ups	hr/d	40	$32.61	$267,264	$0.086
Generator Rental – 1300kW LNG Package	month	1	$62,171.47	$746,058	$0.136
Generator Rental – 750kW LNG Package	month	1	$21,941.06	$263,293	$0.048
TOTAL				$1,993,943	$0.364

21.8.1.7 THREE HILLS MINE REPAIR MATERIALS

Overhaul and maintenance costs of equipment, along with miscellaneous operating supplies for each area, were based on a unit cost per ton of material processed. The unit cost for each area was developed from data obtained from other similar operations.

Maintenance and repair costs for all areas are estimated to average $0.07 per ton of ore.

21.8.2 HASBROUCK MINE PROCESS AND SUPPORT SERVICES OPERATING COSTS

Process operating costs for the Hasbrouck Mine were estimated by KCA based upon unit consumption, and, where possible, have been broken down by area. First year operating cost for the process, laboratory, and service and support is $4.58 per ton of ore processed, and the remaining annual operating cost is $4.82 per ton of ore processed. These costs do not include water supply costs for make-up water. RESPEC applied these costs using fixed and variable portions through the LOM, which includes final rinsing of the leach pad at the end of processing. The resulting LOM processing cost for Hasbrouck is $5.04 per ton of ore. The increase in operating cost per ton is a function of applying the fixed costs through the end of mine rinsing of the leach pad.

Process operating costs for the project have been estimated from first principles. Labor costs are estimated using project specific staffing, salary, wage, and benefit requirements. Unit consumption of materials, supplies, power, water, and delivered supply costs are also estimated.

Operating costs are based upon ownership of all process production equipment and site facilities (some mobile equipment including the crushing area loader and the dozer for the heap leach will be supplied by the mining contractor), as well as the owner employing and paying for all operating, maintenance, and support personnel.

Operating costs have been estimated and are presented without contingency allowances and are considered to have an accuracy range of +/- 20%.

Operating costs estimates have been based upon information obtained from the following sources:

- Project metallurgical test work and process engineering;
- Budgetary quotations from potential suppliers of project operating and maintenance supplies and materials;
- Recent KCA project file data; and
- Experience of KCA staff with other similar operations.

Where specific data does not exist, cost allowances have been based upon consumption and operating requirements from other similar properties for which reliable data exists. Freight costs have been estimated where delivered prices were not available.

All costs are presented in 4th quarter 2022 US dollars and do not include Nevada sales tax.

Table 21-22 shows the process and support services operating costs by area.

Table 21-22 Hasbrouck Mine Process & Support Operating Cost

		Year 1	Years 2 On		Year 1	Years 2 On	Year 1	Years 2 On
	Units	Qty	Qty	Unit Costs, US$	Annual Costs, US$	Annual Costs, US$	US$ per Ton Ore	US$ per Ton Ore
Labor								
Process	ea	54	54		$5,820,580	$5,820,580	$0.92	$0.92
Lab	ea	9	9		$958,500	$958,500	$0.15	$0.15
SUBTOTAL					$6,779,080	$6,779,080	$1.08	$1.08
Water Supply & Distribution								
Supply	gal/d	430,000	430,000					$0.00
Power	kWh/ton	0.100	0.100	$0.099	$62,269	$62,269	$0.01	$0.01
Maintenance Supplies	lot				$58,590	$58,590	$0.01	$0.01
SUBTOTAL					$120,859	$120,859	$0.02	$0.02
Crushing								
Power	kWh/ton	3.056	3.056	$0.099	$1,904,202	$1,904,202	$0.30	$0.30
Wear	$/ton Ore				$2,444,346	$3,958,067	$0.39	$0.63
Overhaul & Maintenance	lot				$819,000	$819,000	$0.13	$0.13
992 Loader (supplied by mine contractor)	hrs/d							
SUBTOTAL					$5,167,549	$6,681,270	$0.82	$1.06
Conveying, Agglomeration & Stacking								
Power	kWh/ton	1.199	1.199	$0.099	$746,796	$746,796	$0.12	$0.12
Foam Dust Suppression					$189,000	$189,000	$0.03	$0.03
Maintenance Supplies	lot				$472,500	$472,500	$0.08	$0.08
SUBTOTAL					$1,408,296	$1,408,296	$0.22	$0.22
Heap Leach Pad & Ponds								
Power	kWh/ton	0.303	0.303	$0.099	$189,001	$189,001	$0.03	$0.03
Piping	lot				$252,000	$252,000	$0.04	$0.04
Pad Gravel (haul and spread only)	ton	-	-	$2.00				
Maintenance Supplies	lot				$126,000	$126,000	$0.02	$0.02
Dozer	hrs/d	6	6	$75.29	$162,626	$162,626	$0.03	$0.03

		Year 1	Years 2 On		Year 1	Years 2 On	Year 1	Years 2 On
SUBTOTAL					$729,628	$729,628	$0.12	$0.12
Adsorption								
Power	kWh/ton	0.0790	0.0790	$0.099	$49,201	$49,201	$0.01	$0.01
Misc. Operating Supplies	lot				$50,000	$50,000	$0.01	$0.01
Maintenance Supplies	lot				$50,000	$50,000	$0.01	$0.01
SUBTOTAL					$149,201	$149,201	$0.02	$0.02
Desorption & Recovery								
Power	kWh/ton	0.655	0.655	$0.099	$408,094	$408,094	$0.06	$0.06
Misc. Operating Supplies	lot				$200,000	$200,000	$0.03	$0.03
Maintenance Supplies	lot				$100,000	$100,000	$0.02	$0.02
Sodium Hydroxide	lbs/day	516.0	516.0	$1.05	$194,863	$194,863	$0.03	$0.03
Hydrochloric Acid @ 28-30%	gal/day	122	122	$3.40	$149,380	$149,380	$0.02	$0.02
Soda Ash	lbs/day	13.7	13.7	$0.61	$3,009	$3,009	$0.000	$0.000
Borax	lbs/day	36.4	36.4	$1.59	$20,835	$20,835	$0.003	$0.003
Silica	lbs/day	22.8	22.8	$0.90	$7,387	$7,387	$0.001	$0.001
Niter	lbs/day	18.2	18.2	$1.35	$8,845	$8,845	$0.001	$0.001
Safety Supplies	lot				$50,000	$50,000	$0.01	$0.01
Diesel Fuel	gal/day	366.9	366.9	$4.00	$535,674	$535,674	$0.09	$0.09
SUBTOTAL					$1,678,087	$1,678,087	$0.27	$0.27
Reagents								
Power	kWh/ton	0.006	0.006	$0.099	$3,988	$3,988	$0.00	$0.00
Cyanide (Ore Consumption)	lbs/ton	0.75	0.75	$1.69	$7,985,250	$7,985,250	$1.27	$1.27
Carbon	lbs/wk	1106	1106	$1.46	$83,968	$83,968	$0.01	$0.01
Cement	lbs/ton	5	5	$0.07	$2,299,500	$2,299,500	$0.37	$0.37
Anti-Scalant	gal/day	65.0	65.0	$24.64	$576,670	$576,670	$0.09	$0.09
Safety Supplies	lot				$50,000	$50,000	$0.01	$0.01
Misc. Operating Supplies	lot				$28,980	$28,980	$0.00	$0.00
Maintenance Supplies	lot				$31,500	$31,500	$0.01	$0.01
SUBTOTAL					$11,059,856	$11,059,856	$1.76	$1.76
Laboratory (At Tonopah)								
Power	kWh/ton	0.000	0.000	$0.099	$0	$0	$0.00	$0.00
Assays, Solids	No./day	100	100	$7.00	$252,000	$252,000	$0.04	$0.04
Assays, Solutions	No./day	100	100	$3.00	$108,000	$108,000	$0.02	$0.02

		Year 1	Years 2 On		Year 1	Years 2 On	Year 1	Years 2 On
Carbon Assay	No./day	5	5	$7.00	$12,600	$12,600	$0.00	$0.00
Consumables	Per Year				$65,000	$65,000	$0.01	$0.01
SUBTOTAL					$437,600	$437,600	$0.07	$0.07
Mobile Equipment / Support Services								
Power	kWh/ton	0.098	0.098	$0.099	$61,278	$61,278	$0.010	$0.010
Maintenance Supplies	lot				$10,000	$10,000	$0.002	$0.002
Fork lift	hrs/d	12	12	$8.90	$38,448	$38,448	$0.006	$0.006
Telehandler	hrs/d	4	4	$27.01	$38,894	$38,894	$0.006	$0.006
Maintenance Trucks	hrs/d	16	16	$59.50	$342,720	$342,720	$0.054	$0.054
Crane (40-t)	hrs/month	12	12	$102.01	$14,689	$14,689	$0.002	$0.002
boomtruck 10 t crane	hrs/d	6	6	$57.96	$125,194	$125,194	$0.020	$0.020
Back Hoe	hrs/d	8	8	$28.15	$81,072	$81,072	$0.013	$0.013
Pick Ups	hrs/d	50	50	$32.61	$586,980	$586,980	$0.093	$0.093
SUBTOTAL					$1,299,276	$1,299,276	$0.21	$0.21
TOTAL COST					$28,829,432	$30,343,153	$4.58	$4.82

21.8.2.1 HASBROUCK MINE PROCESS PERSONNEL AND STAFFING

Staffing requirements, wage and salary for process and administration have been estimated by KCA. Burden information for personnel was provided by WVM and has been included in the wage and salary data. Staffing levels, wages, and wage burdens of several operating mines in the area have been reviewed by management and found to accurately reflect current costs.

The work force will consist of approximately 54 persons in the plant areas and 9 persons in the laboratory. The staffing costs for the process plant are estimated at $5,821,000 and for the laboratory at $959,000.

21.8.2.2 HASBROUCK MINE POWER

Power usage for the process and process-related infrastructure was derived from estimated connected loads assigned to powered equipment from the mechanical equipment list. Equipment power demands under normal operation were assigned and coupled with estimated on-stream times to determine the average energy usage and cost.

The total attached power for the process and infrastructure is estimated at 7.5 MW. The total consumed power for these areas is estimated to be 4.6 kWh/ton of ore. Power costs at the Hasbrouck site are quoted by NV Energy at $0.099/kWh. Emergency power will be provided by an on-site diesel or LNG generator.

Power requirements are presented in Table 21-23.

Table 21-23 Hasbrouck Mine Process Power and Consumption

Area / Description	Attached Power (kW)	Average Demand (kW)
Area 4301 - Water Distribution	400	234
Area 5004 - Primary Crushing	409	218
Area 5023 - Secondary & Tertiary Crushing	3,268	2,041
Area 5041 - Ore Reclaim & Stacking	1,298	874
Area 5150 - Heap-leach & Solution Handling	571	347
Area 5184 - Adsorption	158	62
Area 5184 - Acid Wash & Elution	731	368
Area 5186 - Electrowinning & Refining	215	160
Area 5184 - Carbon Handling & Regeneration	264	165
Area 6051 - Reagents	8	6
Ancillaries	194	78
Total	7,516	4,554

21.8.2.3 HASBROUCK MINE CONSUMABLE ITEMS

Operating supplies have been estimated based upon unit costs and consumption, where possible, and have been broken down by area. In the sections below the assumptions and unit costs associated with the development of the operating costs are presented. All freight costs have been included. Reagent consumptions are derived from test work and from the Design Criteria. Other costs were estimated from past KCA experience with similar operations. Table 21-24 shows the consumption of major consumables.

Table 21-24 Process Consumable Items – Hasbrouck

Item	Form	Storage Capacity	Annual Consumption
Cement - Portland Type II	Bulk	100 tons	15,750 tons
Sodium Cyanide (30%)	30% Bulk Liquid Delivery	12.0 tons	2,400 tons
Activated Carbon	1,100 lb Super sack	22 tons	30 tons
Diesel	Bulk Delivery Truck	1,791 gal	134,000 gal
Antiscalant	Liquid Tote, 240 gal bins	8 totes (1,920 gal)	23,400 gal
Hydrochloric Acid (32%)	240 gal Liquid Tote bins	6 totes (1,440 gal)	44,000 gal
Sodium Hydroxide	50% Liquid Delivered	15.3 tons	93 tons
Silica	Dry Solid Sacks	1 ton	4.1 tons
Borax	Dry Solid Sacks	2 tons	6.6 tons
Soda Ash	Dry Solid Sacks	1 ton	2.5 tons
Niter	Dry Solid Sacks	1 ton	3.3 tons

Operating costs for these items have been distributed based on tonnage and gold production, or smelting batches, as appropriate.

Hasbrouck Mine Heap-Leach Consumables

Pipes, Fittings and Emitters – The heap pipe costs include expenses for broken pipe, fittings and valves, and abandoned tubing. The heap pipe costs are estimated to be $0.04/ton of ore and are based on previous detailed studies conducted by KCA on similar projects.

Sodium Cyanide (NaCN) – Delivered sodium cyanide is quoted at $1.69/lb. Cyanide is consumed in the heap leach and ADR. Cyanide consumptions for the heap is 0.75lb/ton of ore.

Cement – Portland Type II cement is added to the heap at 5 lb/ton for agglomeration and pH control based on metallurgical test work evaluations. A delivered price of $0.07/lb has been used based on supplier budgetary pricing.

Antiscale Agent (Scale Inhibitor) – Antiscale consumption is based on an average dosage rate of 6 ppm to the suctions of the barren and pregnant pumps. A delivered price of $24.64/gal has been used based on a supplier quote.

Hasbrouck Mine Process Consumables

The Hasbrouck Mine will utilize an ADR plant located at the mine site. All process consumables will be stored and consumed at Hasbrouck.

Carbon – Carbon is used for the adsorption of gold from the pregnant solution in the ADR and is estimated to be consumed at an average of 30 tons per year. Carbon is quoted at $1.46/lb.

Caustic Soda (NaOH) – Caustic NaOH consumption is estimated to be 93 tons per year and is quoted at $1.05/lb. Caustic consumption is calculated based on the number of strips per year and varies based on metal production.

Hydrochloric Acid - Hydrochloric acid consumption for the ADR circuit is estimated to be 44,000 gal/year. Hydrochloric acid for the carbon acid wash circuit is supplied at a cost of $3.40/gal. Hydrochloric acid consumption is based on 41 gallon of acid per ton carbon stripped and varies based on metal production.

Smelting Fluxes - It has been estimated that 1.0 lb of mixed fluxes per lb of precious metal precipitate produced will be required. The estimated delivered cost of these fluxes, which includes borax, silica, niter, and soda ash, is $1.22/lb, which is based on data from similar previous KCA projects.

21.8.2.4 HASBROUCK MINE LABORATORY

Fire assaying and solution assaying of samples will be conducted at the laboratory to be located in Tonopah. It is estimated that approximately 100 solids assays at $7.00/assay, 5 carbon assays at $7.00/assay, and 100 solutions assays at $3.00/assay, will be performed each day. The cost of an assay only includes supplies; the associated labor is included under Labor in the operating costs. These costs do not include the cost to rent the building.

21.8.2.5 HASBROUCK MINE FUEL

The primary fuel source for the project will be diesel fuel. Diesel will be used by the mobile equipment, as well as by the boiler and kiln at Three Hills, and the backup generator in the process area. Diesel is estimated at $3.25/gal.

Fuel costs for mobile equipment have been included in the hourly operating costs for these units.

21.8.2.6 HASBROUCK MINE MOBILE EQUIPMENT

Numerous pieces of support equipment are required for the processing areas. The majority of the mobile equipment will be transferred to Hasbrouck from Three Hills Mine and include light vehicles, a maintenance truck, forklifts, one 40-ton crane, a boom truck, a telehandler and a backhoe. The costs to operate and maintain each of these pieces of equipment have been estimated using primarily published information. Otherwise, allowances have been made based upon experience in similar operations.

Support equipment annual operating costs have been estimated to average $1,300,000 per year, or $0.21/ton of ore. Table 21-25 presents the Hasbrouck support equipment operating costs.

Table 21-25 Hasbrouck Mine Support Equipment Operating Costs

	Units	Qty	Unit Costs, USD	Costs, USD	USD per Tonne Ore
Power	kWg.ton	0.098	$0.099	$61,278	$0.010
Maintenance Supplies	lot			$10,000	$0.002
Fork lift	hr/d	12	$8.90	$38,448	$0.006
Telehandler	hr/d	4	$27.01	$38,894	$0.006
Maintenance Trucks	hr/d	16	$59.50	$342,720	$0.054
Crane (40 ton)	hr/month	12	$102.01	$14,689	$0.002
Boom Truck 10 ton crane	hr/d	6	$57.96	$125,194	$0.020
Back Hoe	hr/d	8	$28.15	$81,072	$0.013
Pick Up Trucks	hr/d	50	$32.61	$586,980	$0.093
TOTAL				$595,876	$0.09

21.8.2.7 HASBROUCK MINE REPAIR MATERIALS

Overhaul and maintenance of equipment, along with miscellaneous operating supplies for each area, were based on a unit cost per ton of material processed. The unit cost for each area was developed from data obtained from other operations, as applicable.

Maintenance and repair costs are estimated to average $0.93 per ton or ore.

21.9 OTHER OPERATING COSTS

Other operating costs are included as general and administration costs and presented in Table 21-26. These costs are based on administration personnel required to manage operations as well as supplies, land holding fees, legal and auditing costs, site communication and IT costs, environmental compliance, surety bond, fees, licensing, travel, light vehicle, site maintenance, janitorial services, and office power. Cost bases were provided by WVM and vendor quotations. WVM inputs were primarily for personnel requirements and salaries, legal and auditing charges, and surety bond costs. Environmental and communication costs were provided by potential contractors that would provide these services. Total general and administration costs are estimated to be about $2,667,000 per year (average of Year 1 through Year 7) including surety payments for bonding.

Table 21-26 General and Administration Costs

Personnel Costs	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Admin Salaried Personnel	K USD	$ 480	$ 585	$ 585	$ 585	$ 585	$ 585	$ 585	$ 585	$ 585	$ -	$ 5,162
Admin Hourly Personnel	K USD	$ 192	$ 280	$ 280	$ 280	$ 280	$ 280	$ 280	$ 280	$ 239	$ -	$ 2,392
Safety & Security Salaried Personnel	K USD	$ 145	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ -	$ 1,691
Environmental Salaried Personnel	K USD	$ 145	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ 193	$ -	$ 1,691
Recruitment Costs	K USD	$ 40	$ 40	$ 20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 100
Total Personnel Costs	K USD	$ 1,002	$ 1,292	$ 1,272	$ 1,252	$ 1,252	$ 1,252	$ 1,252	$ 1,252	$ 1,211	$ -	$ 11,037
General G&A Costs												
Supplies & General Maintenance	K USD	$ 108	$ 144	$ 144	$ 144	$ 144	$ 144	$ 144	$ 144	$ 60	$ -	$ 1,176
Land Holdings	K USD	$ 86	$ 115	$ 115	$ 115	$ 115	$ 115	$ 115	$ 115	$ 48	$ -	$ 939
Off Site Overhead	K USD	$ 45	$ 60	$ 60	$ 32	$ 18	$ 18	$ 18	$ 18	$ 18	$ -	$ 287
Leagal, Audits, Consulting	K USD	$ 37	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 20	$ -	$ 400
Computers, IT, Internet, Software, Hardware	K USD	$ 50	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 28	$ -	$ 539
Environmental, Montoring Wells, Reporting	K USD	$ 150	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 83	$ -	$ 1,634
Bond Surety Payments	K USD	$ 1,385	$ 103	$ 103	$ 103	$ 103	$ 103	$ (1,283)	$ -	$ -	$ -	$ 616
Water Rights Leases	K USD	$ 20	$ 10	$ 10	$ 10	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 850
Donations, Dues, PR	K USD	$ 23	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 13	$ -	$ 245
Fees, Licenses, Misc Taxes, Insurance	K USD	$ 180	$ 240	$ 240	$ 240	$ 240	$ 240	$ 240	$ 240	$ 100	$ -	$ 1,960
Travel, Lodging, Meals, Entertainment	K USD	$ 41	$ 54	$ 54	$ 54	$ 54	$ 54	$ 54	$ 54	$ 23	$ -	$ 441
Telephones, Computers, Cell Phones	K USD	$ 59	$ 78	$ 78	$ 78	$ 78	$ 78	$ 78	$ 78	$ 33	$ -	$ 637
Light Vehicle Maintenance, Fuel	K USD	$ 84	$ 112	$ 112	$ 112	$ 112	$ 112	$ 112	$ 112	$ 47	$ -	$ 917
Small Tools, Janitorial, Safety Supplies	K USD	$ 50	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 28	$ -	$ 539
Equipment Rentals	K USD	$ 45	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 25	$ -	$ 490
Access Road Maintenance	K USD	$ 36	$ 48	$ 48	$ 48	$ 48	$ 48	$ 48	$ 48	$ 20	$ -	$ 392
Office Power	K USD	$ 39	$ 53	$ 53	$ 53	$ 49	$ 49	$ 49	$ 49	$ 20	$ -	$ 414
Total General G&A Costs	K USD	$ 2,437	$ 1,488	$ 1,488	$ 1,460	$ 1,532	$ 1,532	$ 146	$ 1,429	$ 664	$ 100	$ 12,475
Total G&A	K USD	$ 3,439	$ 2,780	$ 2,760	$ 2,712	$ 2,784	$ 2,784	$ 1,398	$ 2,681	$ 1,875	$ 100	$ 23,512

Reclamation costs were estimated based on BLM RCE spreadsheets prepared by WestLand Resources. These costs were included in the cash-flow spreadsheets as a capital cost. Reclamation costs were estimated to be $6,414,000 and $7,420,000 for Three Hills and Hasbrouck respectively. Three Hills reclamation costs were applied to years 4 through 6 to reclaim waste dumps and leach pads after final leaching of ore. These costs are assumed to pay for the drain down of leach pads and ultimate reclamation. Note that the costs of administration and offices during the drain-down period are included in the G&A costs.

Reclamation costs for Hasbrouck were applied equally over the last 2 years of the mine life.

22.0 ECONOMIC ANALYSIS

All monetary values in this section are in US dollars.

RESPEC completed an economic analysis based on the cash flow developed from the production schedule and the capital and operating costs previously discussed. Table 22-1 summarizes project economics. These values are based on 100% of the project.

Table 22-1 Hasbrouck Project Economic Summary

	Units	Three Hills Mine	Hasbrouck Mine	Total Hasbrouck Project
PROJECTED HEADGRADE	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.58	0.017 - 0.59
Preliminary Reserve Values				
Ore	million tons	9.65	34.37	44.0
Annual Ore	million tons	4.8	6.3	5.9
Processing Rate	tons per day	15,000	17,500	15,892
Stripping Ratio	waste:ore	0.86	1.19	1.12
Contained Metal				
Gold Grade	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.58	0.017 - 0.59
Silver Grade	oz Ag/ton - g Ag/t	NA	0.306 - 10.48	0.239 - 8.18
AuEq Grade (1)	oz AuEq/ton - g AuEq/t	0.018 - 0.62	0.018 - 0.61	0.018 - 0.61
Gold	kOz	175	578	753
Silver	kOz	NA	10,504	10,504
AuEq (1)	kOz	175	610	785
Recoverable Metal				
Gold Recovery	%	82.7%	72.1%	74.6%
Silver Recovery	%		18.3%	18.3%
Gold	kOz	144	417	561
Silver	kOz	NA	1,918	1,918
AuEq ($1,275/$18.21)	kOz	144	441	585
Average Annual Gold Production	kOz	71	69	70
Averge Annual Silver Production (2)	kOz	NA	319	319
Average Annual AuEq Production	kOz	71	73	74
Gold Price	US$/oz	$ 1,790	$ 1,790	$ 1,790
Silver Price	US$/oz	$ 22.50	$ 22.50	$ 22.50
CAPITAL				
Initial Capex	US$ million	$ 66.2		
Sustaining & Growth Capex	US$ million		$ 155.9	
Growth Capex	US$ million		$ 122.7	
Sustaining Capex	US$ million		$ 33.2	
LOM Capex	US$ million			$ 222.1
Contingency (included)	US$ million	$ 7.5	$ 24.4	$ 32.0
Contingency (included)	%	13%	19%	17%
Working Capital	US$ million	$ -		$ -
FUNDING				
Funding Requirement (at year -1)		$ 66.2		
Free Cash Flow from Three Hills		$ 159.2		
Funding Requirement (at year 1)(3)			$ (32.1)	
Total Funding Requirement				$ 34.1
Adjusted Operating Cost per Ton of Ore (3)	US$/ton ore	$ 9.81	$ 10.08	$ 10.02
Mining	US$/ton ore	$ 3.83	$ 4.20	$ 4.12
Processing	US$/ton ore	$ 3.33	$ 5.04	$ 4.67
G&A	US$/ton ore	$ 0.71	$ 0.46	$ 0.52
Other (4)	US$/ton ore	$ 1.94	$ 0.38	$ 0.72
Adjusted Operating Cost (3)	US$/oz Au net of by-products	$ 656	$ 831	$ 786
All-in Sustaining Cost (5)	US$/oz Au net of by-products	$ 701	$ 938	$ 877
All-in Cost (6)	US$/oz Au net of by-products	$ 1,125	$ 1,232	$ 1,205
Mine Life	year	1.7	7.0	8.7
NPV (5%) - pre-tax	US$ million			$ 239.6
IRR - pre-tax	%			57.1%
NPV (5%) - after tax	US$ million			$ 206.2
IRR - after tax	%			51.4%
Payback Period	year			2.9

Notes:

1. Gold equivalent calculations are made using the ratio of recovered silver / gold and metal prices.
2. Silver production is averaged over the Hasbrouck Mine life only
3. Difference between Funding and Capex from free cash flow from Three Hills Mine
4. World Gold Council - Adjusted Operating Costs include:
   - On-site mining and G&A, royalties and production taxes, permitting and community cost related to current operations, 3rd party smelting, refining and transport costs, stock-piles and inventory write-downs, site-based non-cash remuneration, operational stripping costs and by-product credits. 'Other' category includes royalties, production taxes, permitting, refining, and by-product credit
5. World Gold Council All-in Sustaining Costs includes:
   - Adjusted Operating Costs (above) plus corporate G&A, reclamation & remediation—accretion & amortization, expenditures sustaining exploration and study costs, capital exploration, capitalized stripping and sustaining capital.
6. World Gold Council All-In Cost includes:
   - All-In Sustaining Costs (above) plus community, permitting, and reclamation and remediation costs not related to current operations and non-sustaining exploration and study costs, capital exploration, capitalized stripping and capital expenditure
7. Some totals may not sum properly due to rounding.

22.1 ECONOMIC PARAMETERS AND ASSUMPTIONS

The economic analysis has been based on economic parameters including metal prices, capital and operating costs, royalties, and application of depreciation, depletion, and tax rates. The remaining assumptions come from the mining and processing production schedules. Capital and operating costs have been discussed previously in Section 21.0.

The economic analysis was based on a gold price of $1,790 per ounce and a silver price of $22.50 per ounce. These prices were selected according to the criteria described in Section 19.

22.1.1 ROYALTIES

Royalties were based on a 4% net smelter return royalty as discussed in Section 4.3. The royalty has been applied by calculating the total recovered ounces of gold and silver, multiplied by the metal prices and payable percentage, and then subtracting transportation and refining costs.

22.1.2 TAXES

Taxes include both Nevada net proceeds tax and federal corporate taxes. Nevada requires payment of a tax on proceeds from minerals. This is typically referred to as the Nevada net proceeds tax or "NPT". This tax was established in 1989 in lieu of property taxes on mineral land. The Nevada constitution was amended to establish the tax on proceeds of all minerals, including oil and gas, at a rate not to exceed 5%.

For operations with annual gross proceeds over $4,000,000, the NPT tax rate is 5%. For operations with gross proceeds less than $4,000,000 annually, the NPT tax rate is dependent on the ratio of net proceeds to gross proceeds. The net proceeds were calculated by taking the total net revenue (after refining costs and royalties) and subtracting the operating costs. The gross proceeds were calculated by taking the gross revenues less the royalties paid (net revenue does not include cost of production).

The NPT tax applied to the net proceeds less than $4,000,000 is applied with an adjustable rate shown in Table 22-2. As per Nevada tax laws, the minimum NPT is based on the property tax rate for the county, which is 3.0195% for Esmerelda County.

Table 22-2 NPT Tax Rate Base on Net Proceeds to Gross Proceeds Ratio

Ratio of Net Proceeds to Gross Proceeds	Tax Rate
Minimum	3.0195%
Greater or equal to 26, less than 34	3.50%
Greater or equal to 34, less than 42	4.00%
Greater or equal to 42, less than 50	4.50%
50 or More	5.00%

For the Hasbrouck Project, positive cash-flow years are projected to have net proceeds greater than $4,000,000, and even though equations in the cash-flow model are designed to capture lower tax rates, the net effect is that a 5% net proceeds tax has been applied throughout.

22.1.3 OTHER ECONOMIC ASSUMPTIONS

RESPEC used multiple discount rates for calculating Net Present Value ("NPV"), including 5%, 8%, and 10%. The economic model was completed in Microsoft Excel using basic Excel functions and formulas to calculate the NPV and Internal Rate of Return ("IRR"). Sensitivity tables were developed using Excel data table analysis.

22.2 PRELIMINARY FEASIBILITY CASH FLOW

The PFS cash flow is presented in Table 22-4 and is based on the economic parameters and assumptions previously discussed. The after-tax NPV at 5% discount rate is $206,159,000, with an after-tax IRR of 51.4%.

22.2.1 HASBROUCK PROJECT PHYSICAL VALUES

The pre-feasibility physical values included quantities of mined and processed material, along with produced metals that provide the basis for the cash-flow analysis. These values were derived from the mining and processing schedules previously discussed in the Mining Methods section. They were reformatted into the cash-flow sheet as shown in Table 22-3.

22.2.2 HASBROUCK PROJECT REVENUES

Project revenues are based on the sales of gold and silver produced using metal prices of $1,790 per ounce of gold and $22.50 per ounce of silver. The ounces sold are the ounces recovered for the project less 0.10% and 0.50% gold and silver respectively to account for refining losses. Refining and transportation costs along with royalties are subtracted from the gross revenues to determine the total net revenue of $1.7 million for the life of the project. The Hasbrouck Project revenue is shown in Table 22-4.

22.2.3 OPERATING COSTS, CAPITAL COSTS, AND PRE-TAX CASH FLOW

Operating costs and capital were discussed in Section 21 and reformatted to fit into the resulting cash-flow sheet. These are shown in Table 22-5. Total operating and capital costs over the life of the project are $456.0 million and $222.1 million respectively. This results in a life of project operating cash flow of $552.5 million and a pre-tax cashflow of $330.5 million.

22.2.4 TAX CONSIDERATIONS AND AFTER-TAX CASH FLOW

Tax considerations and the after-tax cash flow are shown in
Table 22-6. Federal income taxes were based on a straight tax rate of 21% or an alternate minimum tax of 15%. The straight federal tax rate of 21% has been applied to a taxable income after adjustments for depreciation and depletion. Depreciation has been applied to the initial capital for both Three Hills and Hasbrouck mines over the life of both mines. Depreciation has been based on the ratio of ounces produced in each year to the total LOM recoverable ounces.

Depletion has been based on the larger amount of either: percent Mineral Reserve depletion, or cost depletion. The percent Mineral Reserve depletion has been assumed to be the minimum of 50% of the yearly depreciation (depletion limit) or 15% of the yearly gross revenue. Cost depletion has been based on the Hasbrouck Project purchase price of $20.3 million, which has been depleted through the life of the mine based on the yearly depletion of recoverable equivalent ounces of gold.

The alternative minimum tax has been based on an alternate depreciation method: depreciating the initial capital for each mine over a straight 10-year period. This depreciation is used to calculate the taxable income for the alternate minimum income, with the alternate tax calculated at 20%. The final federal corporate tax has been assumed to be the greater amount of the "normal" federal corporate tax at 21% or the alternate minimum tax.

WVM has determined it is possible to make use of a tax credit of $2,562,000 based on the previous year's losses.

The resulting after-tax cash flow for the Hasbrouck Project is estimated to be $286.4 million with a payback period of 2.86 years after the start of production, which includes the payback of additional capital expenditures for the startup of the Hasbrouck Mine which is financed from the production at the Three Hill Mine.

The total Hasbrouck Project after-tax NPV(5%) is $206.6 million with an after-tax internal rate of return of 51.4%.

Table 22-3 Hasbrouck Project Physicals

Material Mined			Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Three Hills	Ore Mined		K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
			oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	0.018
			K Ozs Au	8	84	83	-	-	-	-	-	-	-	175
		Waste	K Tons	966	4,735	2,630	-	-	-	-	-	-	-	8,331
		Total	K Tons	1,506	10,185	6,293	-	-	-	-	-	-	-	17,984
		Strip Ratio	W:O	1.79	0.87	0.72								0.86
Hasbrouck	Ore Mined		K Tons	-	-	564	5,887	6,388	6,388	6,388	6,405	2,352	-	34,370
			oz Au/ton	-	-	0.013	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
			K Ozs Au	-	-	7	103	120	127	95	86	39	-	578
			oz Ag/ton	-	-	0.141	0.328	0.306	0.344	0.320	0.239	0.326	-	0.306
			K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
		Waste	K Tons	-	-	3,546	11,217	3,358	3,706	8,601	9,116	1,305	-	40,849
		Total	K Tons	-	-	4,110	17,104	9,745	10,094	14,989	15,521	3,656	-	75,219
		Strip Ratio	W:O			6.29	1.91	0.53	0.58	1.35	1.42	0.55		1.19
Total Mining	Ore Mined		K Tons	540	5,450	4,228	5,887	6,388	6,388	6,388	6,405	2,352	-	44,023
			oz Au/ton	0.014	0.015	0.021	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
			K Ozs Au	8	84	90	103	120	127	95	86	39	-	753
			oz Ag/ton	-	-	0.019	0.328	0.306	0.344	0.320	0.239	0.326	-	0.239
			K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
		Waste	K Tons	966	4,735	6,176	11,217	3,358	3,706	8,601	9,116	1,305	-	49,180
		Total	K Tons	1,506	10,185	10,403	17,104	9,745	10,094	14,989	15,521	3,656	-	93,203
		Strip Ratio	W:O	1.79	0.87	1.46	1.91	0.53	0.58	1.35	1.42	0.55		1.12
Material Processed	***Three Hills Leach***													
	Material Placed on Pad		K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
			oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	0.018
			K Ozs Au	8	84	83	-	-	-	-	-	-	-	175
	Recoverable		K Ozs Au	6	68	71	-	-	-	-	-	-	-	144
	Recovered		K Ozs Au	-	54	88	2	-	-	-	-	-	-	144
	Cumulative Recovery		%	0.0%	59.0%	81.7%	82.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Hasbrouck Leach													
	Material Placed on Pad		K Tons	-	-	564	5,887	6,388	6,387	6,388	6,405	2,352	-	34,370
			oz Au/ton	-	-	0.013	0.018	0.019	0.020	0.015	0.013	0.017	-	0.017
			K Ozs Au	-	-	7	103	120	127	95	86	39	-	578
			oz Ag/ton	-	-	0.141	0.328	0.306	0.344	0.320	0.239	0.326	-	0.306
			K Ozs Ag	-	-	80	1,933	1,953	2,198	2,045	1,529	766	-	10,504
	Recoverable Au		K Ozs Au	-	-	3	63	84	95	73	68	32	-	417
	Recovered Au		K Ozs Au	-	-	1	49	80	97	77	67	46	-	417
	Cumulative Au Recovery		%	0.0%	0.0%	11.6%	44.8%	56.4%	63.5%	67.2%	68.8%	72.1%	0.0%	
	Recoverable Ag		K Ozs Ag	-	-	19	413	368	380	348	260	130	-	1,918
	Recovered Ag		K Ozs Ag	-	-	2	335	375	384	362	286	175	-	1,918
	Cumulative Ag Recovery		%	0.0%	0.0%	3.0%	16.7%	18.0%	17.8%	17.7%	17.9%	18.3%	0.0%	
	Total Au Production		K Ozs Au	-	54	89	50	80	97	77	67	46	-	561
	Total Ag Production		K Ozs Ag	-	-	2	335	375	384	362	286	175	-	1,918
	Total AuEq Production		K Ozs AuEq	-	54	89	55	85	102	81	70	48	-	585

Table 22-4 Hasbrouck Project Revenues

Revenues		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
	Payable Metal - Au	K Ozs Au	-	54	89	50	80	97	77	67	46	-	561
	Payable Metal - Ag	K Ozs Ag	-	-	2	333	373	382	360	285	174	-	1,908
	Gold Revenue	K USD	$ -	$ 97,001	$ 159,574	$ 90,173	$ 143,727	$ 174,011	$ 137,732	$ 119,427	$ 82,012	$ -	$ 1,003,655
	Silver Revenue	K USD	$ -	$ -	$ 54	$ 7,489	$ 8,394	$ 8,587	$ 8,096	$ 6,407	$ 3,907	$ -	$ 42,934
	Gross Revenue	K USD	$ -	$ 97,001	$ 159,628	$ 97,662	$ 152,121	$ 182,598	$ 145,828	$ 125,833	$ 85,919	$ -	$ 1,046,590
	Off-Site Costs												
	Transp. & Refining - Au	K USD	-	60	98	55	88	107	85	73	50	-	617
	Transp. & Refining - Ag	K USD	-	-	1	201	225	230	217	172	105	-	1,151
	Total Off-Site Costs	K USD	$ -	$ 60	$ 100	$ 256	$ 313	$ 337	$ 302	$ 245	$ 155	$ -	$ 1,768
	Royalties	K USD	$ -	$ 2,307	$ 3,820	$ 3,642	$ 5,838	$ 7,058	$ 5,594	$ 4,752	$ 3,311	$ -	$ 36,322
	Net Revenue	K USD	$ -	$ 94,634	$ 155,708	$ 93,764	$ 145,970	$ 175,203	$ 139,932	$ 120,836	$ 82,452	$ -	$ 1,008,500

Table 22-5 Operating Costs, Capital Costs, and Pre-Tax Cash Flow

Operating Costs		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Three Hills	Mining Cost	K USD	$ -	$ 22,909	$ 14,099	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 37,008
	Process Cost	K USD	$ -	$ 16,762	$ 13,230	$ 2,154	$ -	$ -	$ -	$ -	$ -	$ -	$ 32,145
Hasbrouck	Mining Cost	K USD	$ -	$ -	$ 5,034	$ 29,683	$ 15,043	$ 20,900	$ 22,208	$ 26,173	$ 21,116	$ -	$ 140,156
	Process Cost	K USD	$ -	$ -	$ -	$ 5,747	$ 28,187	$ 30,589	$ 30,589	$ 30,589	$ 30,672	$ 16,929	$ 173,301
	Re-handle	K USD	$ -	$ -	$ -	$ 734	$ 796	$ 793	$ 796	$ 798	$ 293	$ -	$ 4,210
Total	Mining Cost	K USD	$ -	$ 22,909	$ 19,132	$ 29,683	$ 15,043	$ 20,900	$ 22,208	$ 26,173	$ 21,116	$ -	$ 177,163
	Process Cost	K USD	$ -	$ 16,762	$ 13,230	$ 7,901	$ 28,187	$ 30,589	$ 30,589	$ 30,589	$ 30,672	$ 16,929	$ 205,446
	Re-handle	K USD	$ -	$ -	$ -	$ 734	$ 796	$ 793	$ 796	$ 798	$ 293	$ -	$ 4,210
	G&A Cost	K USD	$ -	$ 4,382	$ 2,879	$ 2,830	$ 2,902	$ 2,902	$ 1,517	$ 2,800	$ 1,994	$ 219	$ 22,804
	Reclamation - Three Hills	K USD	$ 1,385	$ 103	$ 103	$ 2,241	$ 2,241	$ 2,241	$ (1,283)	$ -	$ -	$ -	$ 7,030
	Reclamation - Hasbrouck	K USD	$ -	$ 1,603	$ 119	$ 119	$ 119	$ 119	$ 119	$ 119	$ 1,562	$ 2,592	$ 8,766
	Net / Gross Proceeds	%	0%	53%	77%	54%	66%	67%	61%	50%	34%	0%	59%
	Nevada Net Proceeds Tax	K USD	$ -	$ 2,524	$ 6,018	$ 2,519	$ 4,840	$ 5,889	$ 4,305	$ 3,024	$ 1,419	$ -	$ 30,538
	Net Operating Cost	K USD	$ 1,385	$ 48,282	$ 41,481	$ 46,026	$ 54,128	$ 63,432	$ 58,250	$ 63,502	$ 57,056	$ 19,740	$ 455,957
	Net Operating Cash Flow	K USD	$ (1,385)	$ 46,352	$ 114,227	$ 47,738	$ 91,842	$ 111,771	$ 81,682	$ 57,334	$ 25,397	$ (19,740)	$ 552,543
Capital Costs													
	Mine Pre-Stripping	K USD	$ 5,021	$ -	$ 190	$ -	$ -	$ -	$ -	$ -	$ 127	$ -	$ 5,338
	Mining Capital	K USD	$ 184	$ -	$ 77	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 261
	Three Hills Process Capital	K USD	$ 26,716	$ 24	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,740
	Hasbrouck Process Capital	K USD	$ -	$ 2,328	$ 76,964	$ -	$ 13,613	$ -	$ -	$ -	$ -	$ -	$ 92,905
	Other Capital	K USD	$ 21,860	$ 7,828	$ 20,802	$ 2,369	$ 3,721	$ 2,849	$ (1,164)	$ 119	$ 1,562	$ 2,592	$ 64,835
	Sub-Total	K USD	$ 53,780	$ 10,180	$ 98,033	$ 2,369	$ 17,333	$ 2,849	$ (1,164)	$ 119	$ 1,689	$ 2,592	$ 190,078
	Working Capital	K USD	$ 4,864	$ (4,864)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0
	Contingency	K USD	$ 7,528	$ 270	$ 18,826	$ 355	$ 3,757	$ 427	$ (175)	$ 18	$ 234	$ 389	$ 31,975
	Salvage	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Capital	K USD	$ 66,172	$ 5,587	$ 116,859	$ 2,725	$ 21,090	$ 3,277	$ (1,339)	$ 137	$ 1,923	$ 2,981	$ 222,053
	Pre-Tax Cash Flow	K USD	$ (67,558)	$ 40,765	$ (2,632)	$ 45,013	$ 70,751	$ 108,494	$ 83,021	$ 57,197	$ 23,474	$ (22,721)	$ 330,490
	Cumulative Pre-Tax Cash Flow	K USD	$ (67,558)	$ (26,792)	$ (29,424)	$ 15,589	$ 86,341	$ 194,835	$ 277,856	$ 335,053	$ 358,527	$ 335,806	
	Payback	Years	1.0	1.0	1.0	0.7	-	-	-	-	-	-	

Table 22-6 Tax Considerations and After-Tax Cash Flow

Depreciation and Depletion (D&D)	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Recoverable Equiv. Au (Start of Yr)	Ozs AuEq	585	585	531	442	387	302	200	118	48	0	
Produced Equivalent Au Ozs	Ozs AuEq	-	54	89	55	85	102	82	70	48	-	
Depreciation Factor (LOM)	%	0.0%	9.3%	15.2%	9.3%	14.5%	17.4%	13.9%	12.0%	8.2%	0.0%	
Depreciation Factor (Yr 2 Capex)	%			16.8%	10.3%	16.0%	19.2%	15.4%	13.3%	9.0%	0.0%	
Global Depreciation Factor	%	0.0%	4.6%	16.0%	9.8%	15.3%	18.3%	14.6%	12.6%	8.6%	0.0%	
Depreciation of Original Capex	K USD	$ -	$ 6,650	$ 10,943	$ 6,697	$ 10,431	$ 12,520	$ 9,999	$ 8,628	$ 5,891	$ -	$ 71,759
Depreciation of Capex (Hasbrouck)	K USD		$ -	$ 25,260	$ 15,459	$ 24,078	$ 28,901	$ 23,082	$ 19,916	$ 13,599	$ -	$ 150,294
Total Depreciation	K USD	$ -	$ 6,650	$ 36,203	$ 22,156	$ 34,508	$ 41,421	$ 33,081	$ 28,544	$ 19,490	$ -	$ 222,053
Taxable Income after Depreciation	K USD	$ -	$ 34,116	$ -	$ 22,857	$ 36,243	$ 67,074	$ 49,940	$ 28,653	$ 3,984	$ -	$ 243,342
Depletion Limit	K USD	$ -	$ 17,058	$ -	$ 11,428	$ 18,122	$ 33,537	$ 24,970	$ 14,326	$ 1,992	$ -	$ 121,671
% Reserve Depletion	K USD	$ -	$ 14,550	$ 23,944	$ 14,649	$ 22,818	$ 27,390	$ 21,874	$ 18,875	$ 12,888	$ -	$ 156,988
Cost Depletion	K USD	$ -	$ 938	$ 3,246	$ 1,986	$ 3,094	$ 3,714	$ 2,966	$ 2,559	$ 1,747	$ -	$ 20,251
Smaller of Limit vs % Depletion	K USD	$ -	$ 14,550	$ -	$ 11,428	$ 18,122	$ 27,390	$ 21,874	$ 14,326	$ 1,992	$ -	$ 109,683
Net Reserve Depletion	K USD	$ -	$ 14,550	$ 3,246	$ 11,428	$ 18,122	$ 27,390	$ 21,874	$ 14,326	$ 1,992	$ -	$ 112,929
Taxable Income after D&D	K USD	$ -	$ 19,565	$ -	$ 11,428	$ 18,122	$ 39,684	$ 28,066	$ 14,326	$ 1,992	$ -	$ 133,659
Taxes												
'Normal' Federal Corporate Tax	K USD	$ -	$ 4,109	$ -	$ 2,400	$ 3,806	$ 8,334	$ 5,894	$ 3,009	$ 418	$ -	$ 28,068
AMT Depreciation (10-year)	K USD	$ -	$ 6,617	$ 6,617	$ 6,617	$ 6,617	$ 6,617	$ 6,617	$ 6,617	$ 6,617	$ 6,617	$ 72,789
AMT Taxable Income	K USD	$ -	$ 19,598	$ 29,586	$ 26,968	$ 46,013	$ 74,487	$ 54,530	$ 36,254	$ 14,865	$ -	$ 302,299
Alternate Minimum Tax (AMT)	K USD	$ -	$ 2,940	$ 4,438	$ 4,045	$ 6,902	$ 11,173	$ 8,179	$ 5,438	$ 2,230	$ -	$ 45,345
US Federal Corporate Tax	K USD	$ -	$ 4,109	$ 4,438	$ 4,045	$ 6,902	$ 11,173	$ 8,179	$ 5,438	$ 2,230	$ -	$ 46,614
Capital Pool as a Tax Credit	K USD		$ 0	$ 2,562	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,562
Net Taxes Paid	K USD	$ -	$ 4,109	$ 1,876	$ 4,045	$ 6,902	$ 11,173	$ 8,179	$ 5,438	$ 2,230	$ -	$ 44,052
After-Tax Cash Flow	K USD	$ (67,558)	$ 36,657	$ (4,508)	$ 40,968	$ 63,850	$ 97,321	$ 74,842	$ 51,759	$ 21,244	$ (22,721)	$ 286,438
Cumulative After-Tax Cash Flow	K USD	$ (67,558)	$ (30,901)	$ (35,409)	$ 5,559	$ 69,409	$ 166,730	$ 241,572	$ 293,331	$ 314,575	$ 291,855	
Payback	Years	1.0	1.0	1.0	0.9	-	-	-	-	-	-	
Pre-Tax Payback Period	Years	2.65	*(From start of production)*									
After-Tax Payback Period	Years	2.86	*(From start of production)*									
Pre-Tax Net Present Value	5%	$ 239,566										
	8%	$ 198,183										
	10%	$ 174,818										
Pre-Tax Internal Rate of Return	IRR	57%										
After-Tax Net Present Value	5%	$ 206,159										
	8%	$ 169,594										
	10%	$ 148,946										
After-Tax Internal Rate of Return	IRR	51.4%										

22.3 CASH-FLOW SENSITIVITY

After-tax cash-flow ("CF") sensitivities to revenue were evaluated by varying the gold price from $1,200 to $2,600 per ounce in $100.00 increments, with one additional price of $1,790 per ounce (used as the final gold price in this study). The silver price was also modified in these sensitivities based on a constant gold to silver price ratio of $1,790: $22.50 (80:1 gold to silver price ratio). Table 22-7 shows the sensitivity analysis by gold price with the base case price of $1,790 $/oz Au highlighted.

Operating and capital cost sensitivities were evaluated from +/- 30% of the values in 10% increments. Results from changes to operating costs are shown in Table 22-8 and results from changes to capital costs are shown in Table 22-9.

Table 22-7 Metal Price Sensitivity

	After Tax Sensitivity - Metal Price (K USD)					
Au Price	Undisc. CF	NPV 5%	NPV 8%	NPV 10%	IRR	Ag Price
$ 1,200	$ (10,541)	$ (22,598)	$ (28,119)	$ (31,190)	-3%	$ 15.08
$ 1,300	$ 41,266	$ 17,295	$ 6,353	$ 212	10%	$ 16.34
$ 1,400	$ 92,298	$ 56,585	$ 40,303	$ 31,139	20%	$ 17.60
$ 1,500	$ 142,515	$ 95,277	$ 73,749	$ 61,615	29%	$ 18.85
$ 1,600	$ 192,876	$ 134,071	$ 107,280	$ 92,167	37%	$ 20.11
$ 1,700	$ 242,466	$ 172,262	$ 140,286	$ 122,237	45%	$ 21.37
$ 1,790	$ 286,438	$ 206,159	$ 169,594	$ 148,946	51%	$ 22.50
$ 1,900	$ 340,186	$ 247,590	$ 205,416	$ 181,591	60%	$ 23.88
$ 2,000	$ 388,886	$ 285,127	$ 237,870	$ 211,166	67%	$ 25.14
$ 2,100	$ 436,784	$ 322,061	$ 269,812	$ 240,279	74%	$ 26.40
$ 2,200	$ 484,679	$ 358,994	$ 301,752	$ 269,392	82%	$ 27.65
$ 2,300	$ 532,561	$ 395,915	$ 333,681	$ 298,494	89%	$ 28.91
$ 2,400	$ 579,590	$ 432,100	$ 364,935	$ 326,956	96%	$ 30.17
$ 2,500	$ 626,034	$ 467,890	$ 395,876	$ 355,152	103%	$ 31.42
$ 2,600	$ 672,126	$ 503,418	$ 426,596	$ 383,149	110%	$ 32.68

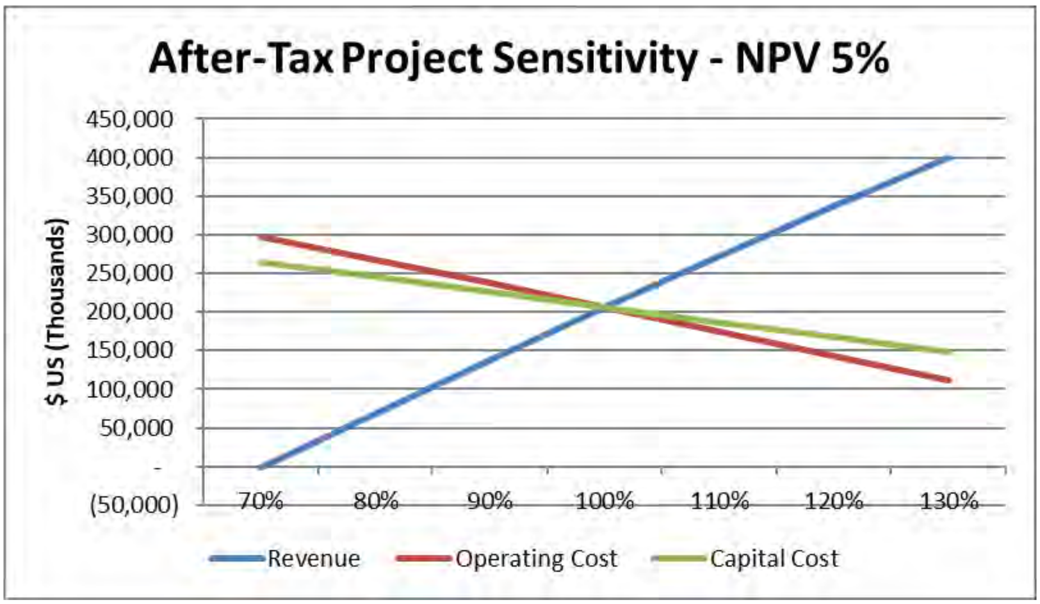
Table 22-8 Operating Cost Sensitivities

	After Tax Sensitivity - Operating Cost (K USD)				
% of Base	Undisc. CF	NPV 5%	NPV 8%	NPV 10%	IRR
70%	$ 407,938	$ 297,468	$ 247,512	$ 219,392	68%
80%	$ 368,061	$ 267,502	$ 221,941	$ 196,272	63%
90%	$ 327,542	$ 237,049	$ 195,953	$ 172,776	57%
100%	$ 286,438	$ 206,159	$ 169,594	$ 148,946	51%
110%	$ 245,205	$ 175,185	$ 143,170	$ 125,061	46%
120%	$ 202,747	$ 143,264	$ 115,922	$ 100,419	40%
130%	$ 159,795	$ 110,972	$ 88,359	$ 75,496	33%

Table 22-9 Capital Cost Sensitivities

	After Tax Sensitivity - Capital Cost (K USD)				
% of Base	Undisc. CF	NPV 5%	NPV 8%	NPV 10%	IRR
70%	$ 352,381	$ 263,786	$ 223,076	$ 199,947	87%
80%	$ 331,040	$ 245,109	$ 205,727	$ 183,393	73%
90%	$ 308,804	$ 225,684	$ 187,704	$ 166,210	61%
100%	$ 286,438	$ 206,159	$ 169,594	$ 148,946	51%
110%	$ 264,196	$ 186,713	$ 151,545	$ 131,734	44%
120%	$ 241,672	$ 167,085	$ 133,354	$ 114,402	37%
130%	$ 218,824	$ 147,224	$ 114,972	$ 96,901	31%

Figure 22-1 After-Tax Project Sensitivities



23.0 ADJACENT PROPERTIES

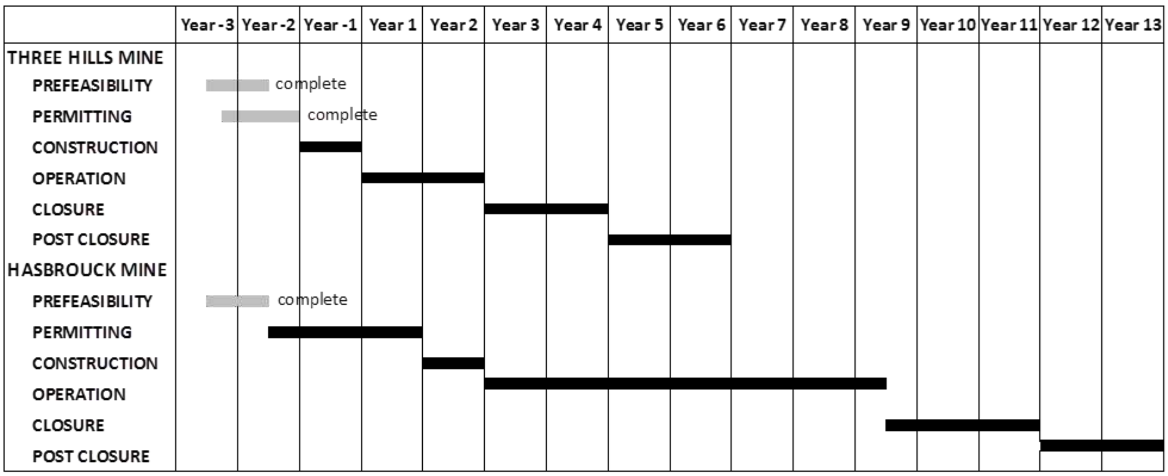
WVM's Hasbrouck Mine property is adjacent to third-party patented and unpatented mining claims in the Divide Mining District owned by the Tonopah Divide Mining Company. The most recent mining in the district took place in the early 1980's from the Falcon pit, on the northeast slope of Gold Mountain, approximately 1.3mi east of Hasbrouck Mountain. The pit was developed by Falcon Exploration on the northwest trending Tonopah Divide lode, from which underground mining prior to the 1940's produced mainly silver. In 1982 and 1983 material from the Falcon pit was trucked by Falcon Exploration to a cyanide heap-leach and recovery site in the valley 5mi southwest of Hasbrouck Peak. Falcon Exploration produced an estimated total of 400,000 oz of silver and 3,000 oz of gold (Bonham et al., 1987). No information is available to RESPEC on the gold and silver grades, or the quantities of metals recovered from the Falcon operation.

24.0 OTHER RELEVANT DATA AND INFORMATION

24.1 PROJECT EXECUTION

A project execution plan has been developed for the Hasbrouck Project. This includes tasks for completing this pre-feasibility study, permitting, and a feasibility study prior to construction. The project execution plan is shown in Table 24-1.

Table 24-1 Pre-Feasibility Schedule for the Three Hills and Hasbrouck Mines



24.2 THREE HILLS CONSTRUCTION SCHEDULE

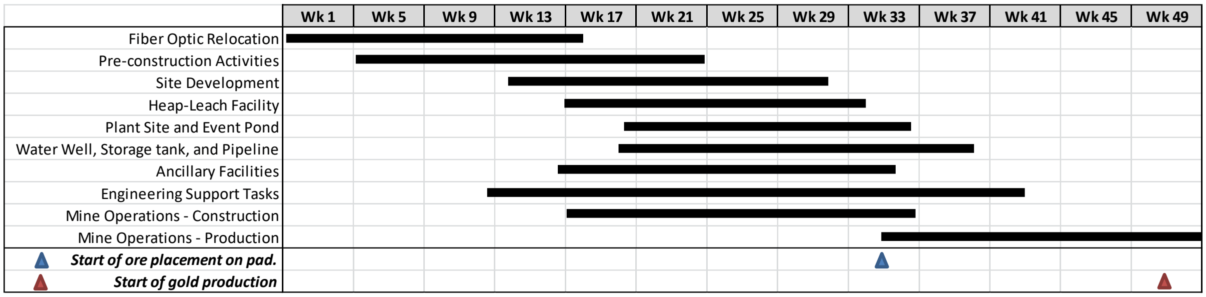
NewFields and RESPEC produced a detailed construction schedule for Three Hills Mine using inputs from WVM and other consultants. WVM requested this schedule to ensure that the various construction tasks and their interactions were understood, and the timing of the startup of operations was achievable.

NewFields provided the main schedule of activities, which defined when certain material would be required for use as overliner, road wearing coarse and general fill materials. RESPEC used this information to adjust the mine designs and production schedule to ensure that the material was available for construction.

Figure 24-1 shows an approximation of the schedule graphically. Key scheduled tasks are:

- Fiber optic relocation;
- Pre-construction activities;
- Site development;
- Heap-leach facility construction;
- Plant site and event pond construction;
- Water well, storage tank, and pipeline installation;
- Ancillary facilities construction;
- Engineering support tasks; and
- Mine operations.

Figure 24-1 Three Hills Production Schedule



Realignment of the fiber optic cable is a critical-path item for the project; the work involved moving it will be done by AT&T. As such, this item has been given a heading of its own. The task has been assigned an 88-day duration. Realignment is to be completed before mining encroaches too closely to the existing fiber optic cable, which runs through the Three Hills project area (see Figure 18-1). For mining purposes, the initial pit used to obtain construction material has been designed so that the crest is offset by a minimum of 300ft from the existing fiber optic cable. This initial crest is approximately 100ft higher than the fiber optic cable, and the lowest bench is about 30ft above the cable providing a buffer against direct shock waves to the cable from blasting operations.

Pre-construction activities will commence upon WVM Board of Directors approval. These activities will include tasks such as establishing an office, generating contract documents, receiving bids for various activities, contract negotiations, and the mobilization of contractors.

Site development requires removal of vegetation and stockpiling of top-soil removed from within the footprints of the various facilities. Mobilization and setup of a portable crushing and screening plant for the manufacturing of overliner and road wearing coarse materials will also occur under this task.

Heap-leach facility construction will involve regrading and fill placement, construction of a diversion channel, and installation of geomembrane, pipework, and overliner materials. Near completion of the leach pad, a request will be made to allow placement of ore onto the facility to enable quicker production of gold once the plant area is complete.

Plant site construction will include site grading and civil/concrete construction along with construction of carbon columns and associated utilities. This task includes procurement and setup of the LNG generator and installation of the barren and pregnant solution tanks within the event pond.

A well will be drilled and developed for the Three Hills Mine water supply and a pipeline installed to convey the water to a storage tank that will be erected on site concurrent with drilling the well.

Ancillary facilities include the construction and installation of the security office and associated infrastructure, project fencing, power to the well, lime silo, and the petroleum-contaminated soil containment area.

Engineering tasks will occur during construction to support the construction management and project execution. These tasks will include quality control testing and inspections, survey and preparation of the as-built documentation for the facilities.

Mine operations will start with mining waste rock required for construction of facilities. NewFields provided waste rock requirements, and RESPEC created a monthly schedule to meet the construction needs. The resulting monthly mining schedule is shown in Table 24-2.

Table 24-2 Monthly Three Hills Construction Mining Schedule

Construction Mining	Units	Total	Mth_-10	Mth_-9	Mth_-8	Mth_-7	Mth_-6	Mth_-5	Mth_-4	Mth_-3	Mth_-2	Mth_-1
Overliner (Tbr)	K Tons	334	-	113	109	113						
Road Course (Tbr)	K Tons	34		11	11	11						
Fill - Pond/Plant	K Tons	185					65	120				
Fill - HLF	K Tons	59					59					
Fill - Roads	K Tons	90							90			
Total	K Tons	702	-	124	120	124	124	120	90	-	-	-
Overliner (Tbr)	K Cu Yrds (Placed)*	235		79	77	79						
Road Course (Tbr)	K Cu Yrds (Placed)*	24		8	8	8						
Fill - Pond/Plant	K Cu Yrds (Placed)*	134					46	88				
Fill - HLF	K Cu Yrds (Placed)*	42					42					
Fill - Roads	K Cu Yrds (Placed)*	69							69			
Total	K Cu Yrds (Placed)*	504	-	87	84	87	88	88	69	-	-	-
Remaining to Dump	K Tons	48,478	-	-	-	-	-	-	-	-	220	44
Remaining to Dump	K Cu Yrds (Placed)**	36,147	-	-	-	-	-	-	-	-	168	34
Percent to Construction	%	1%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%

* Construction material placed assumed a 1.3 swell to represent placement and compaction

** Tonnage to dumps use a 1.4 swell reflecting loose material placed at the dump compcated by haul trucks

24.3 OTHER RELEVANT INFORMATION

There is no other relevant information known to the authors that is not included in this report.

25.0 INTERPRETATIONS AND CONCLUSIONS

RESPEC considers the Hasbrouck Project to be a project of merit and economically viable. The Three Hills, Hill of Gold, and Hasbrouck gold-silver mines consist of near-surface, epithermal mineralization of the low-sulfidation type hosted within Miocene-age volcaniclastic and tuffaceous rocks of the Siebert Formation, and the underlying, uppermost part of the Fraction Tuff. At Three Hills Mine, the higher gold grades are associated with discontinuous, irregular veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz within a broad zone of pervasive silicification. At the Hasbrouck Mine, the highest gold grades are associated with narrow, generally near-vertical, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccias. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent, but is especially evident in many of the moderate-grade zones along the peripheries of the deposit. The mineralization at the Hasbrouck Mine is accompanied by strong pervasive silicification, with associated adularia and pyrite. At Hill of Gold, the gold mineralization is within two zones, the first within a northeast trending structural zone along long narrow "lenses", and the second is at or near the Oddie-Siebert and Oddie-Fraction contact. Subsequent to mineralization, oxidation has largely to completely destroyed the pyrite and other sulfide minerals at Hasbrouck, Hill of Gold, and Three Hills, respectively.

The core of the Three Hills and Hasbrouck are relatively well-defined and infill drilling is not expected to materially change the current Mineral Resource model and estimate other than to increase the confidence level of the Mineral Resource.

25.1 DATA AND MINERAL RESOURCES

The current Mineral Resources for Three Hills Mine are based on a database consisting of 291 drill holes totaling 88,199ft of drilling. Some form of rotary percussion drilling was used for 273 of the drill holes, accounting for a large majority (82,787ft) of the drilling. Eighteen diamond core holes for 5,412ft are included in the Three Hills drilling database.

For the Hasbrouck Mine, the current Mineral Resources are estimated from a drilling database containing 317 drill holes, totaling 216,761ft. The large majority of the drilling has been by reverse circulation (252 holes for 179,174ft), along with 43 diamond core holes for 26,807ft and 22 air-track holes for 8,980ft.

For Hill of Gold, the historical Mineral Resources are estimated from a drilling database containing 89 drill holes, totaling 29,926ft. Most of the drilling has been by reverse circulation (83 holes for 27,941ft), along with 6 diamond core holes for 1985ft.

RESPEC has evaluated and performed verification of the Three Hills and Hasbrouck databases and considers the assay data to be adequate for the estimation of the current Mineral Resources.

25.2 HASBROUCK MINE ESTIMATED MINERAL RESOURCES

The current Hasbrouck Mine block model estimate, fully diluted to 20ft by 20ft by 20ft blocks, is inclusive of Mineral Reserves and includes the following Measured, Indicated, and Inferred Mineral Resources, at a cut-off grade of 0.007 gold equivalent ounces per ton, as shown in Table 25-1.

Table 25-1 Hasbrouck Mine Reported Mineral Resources (0.007oz AuEq/ton cut-off grade)

Hasbrouck Mine Mineral Resources					
Measured					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	6,987	0.019	0.39	134	2,752
Indicated					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	35,041	0.015	0.27	516	9,404
M&I					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	42,028	0.015	0.29	651	12,156
Inferred					
Material	K tons	oz Au/ton	oz Ag/ton	K oz Au	K oz Ag
Total	5,161	0.011	0.19	56	986

1. Mineral Resources for Hasbrouck Mine are estimated using a gold equivalent 0.007oz AuEq/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1,850 per ounce and silver price of $22.75 per ounce , a mining cost of $2.39/ton mined, a processing cost of $4.81/ton processed, a lithologic- and depth dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.36/ton processed, and a 2.38% NSR Royalty.
2. The Hasbrouck gold equivalent cutoff grade is using the following formulas:
   - Oz AuEq/ton = oz Au/ton + (oz Ag/ton x AuEq Factor)
   - AuEq Factor = (Au Price / Ag Price) x (Au Recovery / Ag Recovery)
   - Upper Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0053)
   - Lower Siebert Formation: oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.0027)
3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
5. The Effective Date of the Mineral Resource estimations is December 15, 2022.
6. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

The AuEq cut-off grade was calculated using the individual gold and silver grades of each block, along with a gold price of $1,850.00 per ounce gold and a silver price of $22.75 per ounce silver.

The Hasbrouck Mine Mineral Resource consists of a single, irregularly shaped deposit that extends for more than 2,800ft in an east-west direction and about 2,400ft north-south. The core of the deposit is relatively well-defined and infill drilling is not expected to materially change the current Mineral Resource model and estimate. However, additional drilling along the periphery of the deposit has the potential to extend the Mineral Resource to the east and west.

25.3 THREE HILLS MINE ESTIMATED MINERAL RESOURCES

The current Three Hills Mine block model estimate, fully diluted to 20ft by 20ft by 20ft blocks, is inclusive of Mineral Reserves and includes the following Indicated and Inferred Mineral Resources, at a cut-off grade of 0.005 gold equivalent ounces per ton, as shown in Table 25-2:

Table 25-2 Three Hills Mine Reported Mineral Resources (0.005oz Au/ton Cut-off)

Three Hills Mine Mineral Resources			
Indicated			
Material	K Tons	oz Au/ton	K oz Au
Total	10,423	0.018	185
Inferred			
Material	K Tons	oz Au/ton	K oz Au
Total	1,008	0.017	17

1. Mineral Resources for Three Hills Mine are estimated using a 0.005oz Au/ton cut-off grade inside an optimized pit shell that was created using a gold price of $1850 per ounce, a mining cost of $2.39/ton mined, a processing cost of $2.98/ton processed, a grade-dependent recovery equation provided by Mr. Mark Jorgensen, G&A cost of $0.42/ton processed, and a 2.38% NSR Royalty.
2. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
3. Indicated Mineral Resources are reported inclusive of Mineral Reserves.
4. These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It is reasonably expected that the majority of inferred mineral resources could be upgraded to a measured or indicated mineral resource with continued exploration.
5. Rounding as required by reporting guidelines may result in apparent discrepancies between tons, grade, and contained metal content.
6. The Effective Date of the Mineral Resource estimations is December 15, 2022.
7. The estimate of Mineral Resources may be materially affected by geology, environment, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

The cut-off grade of 0.005 oz Au/ton was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. There are no Mineral Resources classified as Measured due to the general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to historical drill hole locations. Indicated Mineral Resources are limited to the north-south core of the deposit; Inferred Mineral Resources comprise the mineralization at depth along the east side of the deposit and the scattered mineralization to the northwest. There are no silver Mineral Resources estimated at Three Hills.

At a cut-off grade of 0.005 oz Au/ton, Three Hills mineralization consists of a single, irregularly shaped deposit that extends for more than 2,700ft north-south and 1,000ft east-west. The deposit remains open at depth to the east and southeast, along the Siebert-Fraction contact.

25.4 MINERAL RESERVES

Metallurgical testing demonstrates that mineralized material at Three Hills is amenable to cyanidation for gold extraction. An average operational gold recovery of 79.0% is expected. Silver contents are low and have not been modelled; silver recovery for Three Hills has not been estimated.

Gold recovery at the Hasbrouck Mine varies with the stratigraphic position of the host rock. The average operational gold recovery from mineralization within the Upper Siebert is expected to be 55.6%. A higher average gold recovery of 76.6% is expected for mineralization hosted by the Lower Siebert. Silver recoveries from the upper and Lower Siebert are expected to be the same, with an average of 24% and 17% recovery for Upper and Lower Siebert respectively.

Table 25-3 Three Hills and Hasbrouck Combined Proven and Probable Mineral Reserves

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	6,130	0.021	126	0.417	2,558
Probable	37,893	0.017	627	0.210	7,946
Proven & Probable	44,023	0.017	753	0.239	10,504

1. Three Hills cut-off used: 0.005 oz Au/ton
2. Hasbrouck cut-off used a $5.17/ton GMV cutoff grade.
3. Mineral reserves are included in the Indicated Mineral Resource.
4. See footnotes in Table 15-12 in respect of assumptions and cautions related to the Mineral Reserves.

RESPEC concludes that mineralization in the Three Hills and Hasbrouck mines is amenable to extraction by open-pit mining. RESPEC has used Measured and Indicated Mineral Resources to define Mineral Reserves for both the Three Hills and Hasbrouck mines, which together compose the Hasbrouck Project (Table 25-3). Mineral Reserve definition was done by first identifying ultimate pit limits using economic parameters and pit optimization techniques. Pit designs were then created based on the pit optimizations, from which production schedules and cash-flow analysis were produced. These form the basis of the Mineral Reserves statement and details of the calculation methods are presented in Section 15.2.

Because Three Hills ore will be processed using ROM leaching, there will be no crushing and stacking costs at Three Hills. Gold and silver recoveries were applied based on estimates provided by Mark Jorgensen of Jorgensen Engineering and Technical Services, LLC, the Qualified Person responsible for Section 13.0. Table 15.2 shows the recoveries used for each deposit.

There are no stated silver Mineral Resources for Three Hills Mine; therefore, silver was not used to generate value in Three Hills. However, for Hasbrouck the value from silver was calculated with constant silver to gold ratio based on $1,750/oz Au to $21.00/oz Ag prices.

Based on optimized pits, RESPEC developed phased pit designs to define the production schedules for both Three Hills and Hasbrouck, which were then used for cash-flow analysis for the pre-feasibility study. All Inferred material was considered to be waste. The final metal prices used for the Hasbrouck Project cash flow was $1,790 per ounce Au and $22.50 per ounce Ag. RESPEC believes the final cash-flow model demonstrates that the deposits will have a positive cash flow and are reasonable with respect to statement of Mineral Reserves for the Hasbrouck Project.

25.5 PROCESSING AND RECOVERY METHODS

The Hasbrouck Project includes two separate facilities to be located 5 miles apart. Three Hills Mine will be constructed and operated first, and will be a 15,000 ton per day, ROM operation, utilizing conventional, cyanide heap-leaching of ore stacked on a single-use pad. Gold will be leached with dilute cyanide solution and recovered from the solution using a carbon adsorption circuit. Loaded carbon will be processed by toll stripping to produce Doré bars.

The Hasbrouck Mine will be constructed after production commences at Three Hills Mine and will be a 17,500 ton per day heap-leach operation utilizing conventional heap leaching of crushed ore stacked on a single use pad. Crushing will be performed in three stages: mined material will pass first through a primary jaw crusher, then two secondary cone crushers, and then through a HPGR unit. Agglomeration with cement will be required prior to stacking of ore on the heap. Gold and silver will be leached with a dilute cyanide solution and recovered using a carbon ADR process to produce Doré bars.

25.6 CAPITAL AND OPERATING COSTS

Detailed capital and operating costs have been estimated based on vendor and contractor quotations for all significant cost items and RESPEC considers them appropriate for a pre-feasibility study. Total estimated life-of-mine capital costs are $222 million. Adjusted operating costs are estimated to be $10.02 per ton of ore or $786 per recovered ounce of gold (based on World Gold Council Non-GAPP Metrics). All-in sustaining cost is estimated to be $877 and all-in cost is $1,205 per recovered ounce of gold (based on World Gold Council Non-GAPP Metrics).

25.7 ECONOMIC ANALYSIS AND SENSITIVITY

The economic analysis shows that the Hasbrouck Project provides a 51% internal rate of return with a $206 million dollar after-tax net present value (5% discount rate). After completion of construction, the mine life is estimated to be 1.7 years for Three Hills and 7.0 years for Hasbrouck, for a total project mine life of 8.7 years, not including construction or closure. The payback period is 2.9 years (not including the construction period).

25.8 RISKS AND OPPORTUNITIES

RESPEC has identified a number of risks and opportunities that may affect the economics of the Hasbrouck Project.

25.8.1 EXTERNAL RISKS

- The Project's economic viability is generally at risk from changes in external factors which would lead to increases in input costs (construction costs, operating costs), or a fall in the price of gold or silver which would reduce revenue.
- A decrease in gold or silver price would not only reduce revenue, but would also reduce the amount of economically minable ore as a decrease in metal prices would result in a higher cut-off grade. Under the current gold price environment, the Mineral Reserves are considered robust. Sensitivity to gold prices is given in Table 22-7.
- While no environmental and permitting risks are currently identified, and permits are in-hand for Three Hills Mine, this is an area where risk to cost and schedule generally exist. Typical environmental and permitting risks include items being discovered on the project site such as sensitive or endangered botany, or cultural artifacts, which would have the effect of extending schedules, increasing permitting costs, and potentially making permitting impossible at the Hasbrouck Mine.

25.8.2 INTERNAL, PROJECT-SPECIFIC RISKS

Internal risks specific to this project are identified here:

Decrease in Mineral Resources:

- Current drill spacing is adequate and there is a low risk of a decrease in Mineral Resources due to additional drilling and subsequent re-modeling and re-estimations.

Construction Execution and Operational Risk

- The Project's economic viability is generally at risk from internal factors such as poor construction or operational execution resulting in cost and schedule over-runs and scope creep.

- During construction and startup at Hasbrouck, there is a potential to cast material down towards the highway during mining operations. RESPEC has assumed that the lower portion of a berm will be constructed with initial waste material to capture any slough from the hillside.
- Blasting could also provide a hazard to travel on the highway near Hasbrouck. During mining operations, the direction of blasting will be important to ensure movement of materials is away from the highway side of the pit. For initial mining prior to the formation of a highwall, the highway will need to be shut down during blasting operations.

Metallurgical and Processing Efficiency Risks:

- There is a risk that permeability in a full-scale heap leach at Three Hills Mine will be inadequate, based on testing done on a ROM bulk sample by KCA in 2014. The ROM bulk sample was taken at the surface and the area where it was taken showed signs of weathering. Crushed column samples taken from core at depth did not demonstrate any issues with permeability during leaching. Additional testing is required to define the level of risk for this issue.
- It is not possible to be certain about percolation through ROM ore at increased stacking heights as no compacted permeability test equipment exists capable of handling material of this particle size.
- The risk of low percolation rates can be mitigated by performing field permeability tests on ROM ore during the early phase of mining and making appropriate adjustments to methods of stacking and leaching. Thus, during initial leaching operations at Three Hills, percolation will be closely monitored to observe the percolation rate, allowing early adjustments to be made as necessary. Early adjustments include installing intermediate drains in the heap at various elevations as the heap grows in height. While this would increase costs somewhat, it is a viable and proven technique which can be implemented simply and quickly should percolation decrease to unacceptable rates as stacking height increases.
- The predicted gold recovery at Three Hills is based on results for crushed material in column tests and on a single 4ft diameter column test which used uncrushed material excavated from surface representing ROM ore. The recommended processing method for Three Hills Mine ore is a ROM heap leach, which is not crushed. Gold deportment was determined to be along fractures and in brecciated zones. There is a risk that the drilling and blasting associated with a normal mining operation might not fracture the ore sufficiently to expose the gold to leaching, which could result in lower recoveries.
- The predicted gold recovery at Hasbrouck is extrapolated based on the effect of HPGR crushing of a composite sample. Variability sampling is required to ensure what effect of HPGR crushing can be applied to the Mineral Resource material.
- This study contemplates using certain pieces of mobile crushing and screening equipment at the Hasbrouck Mine that will tend to have a fall-off in availability and higher maintenance costs over time when compared to non-mobile equipment. Thus, the availability factor in this study may have been overstated. This risk can be mitigated by increasing the robustness of foundations that mobile equipment will be mounted on to approximate those of non-mobile equipment.

Risk of Increased Operating Costs

- If the current off-site toll carbon processor cannot handle all the loaded carbon, then the operating costs will increase due to the higher cost of selling the loaded carbon to an ashing refiner.

- Fuel price used in this study for contract mining is $3.25 per gallon (note that fuel taxes are not applicable and have not been included) based on anticipated long-term fuel costs. Should the cost of fuel rise, mining costs will increase. Note that the opposite can be true if fuel prices drop.
- Geotechnical studies are preliminary at Hasbrouck Mine and additional drilling is recommended to raise the level of certainty for final pit slope angles. There is a risk that additional geotechnical studies might result in flatter pit slopes than used in this study, which would have an adverse impact on costs and Mineral Reserves. This impact of flatter slopes on project economics would be minimal because a large portion of the mining is above the crest of the ultimate pit. The risk of steeper pit slopes is low, given that conservative slope angles that have been assumed.
- Finding and keeping the skilled employees required to operate the Hasbrouck Project might prove challenging, given its rural location. Inadequate staffing would tend to increase operating costs by reducing operating efficiencies and increasing repair and maintenance costs. Recruiting costs might be higher than predicted.

25.8.3 OPPORTUNITIES

The following opportunities have been identified.

Potential for Mineral Resource Expansion and Upgrade:

- Additional drilling could result in reclassification of Mineral Resources from Inferred to Indicated, and from Indicated to Measured. Within the 2 pits there are 2,749,000tons of Inferred Mineral Resources that are currently treated as waste. Any upgrade of Inferred material to Indicated or higher classification, could improve the Project economics by increasing ore tonnage and reducing waste tonnage, extending the LOM and increasing overall revenues. The 2,749,000 million tons of Inferred Mineral Resources in the pits are a subset of the total Inferred Mineral Resources of 6.2 million tons, which are all subject to classification upgrades with additional drilling in strategic areas.

Potential Decrease in Mining Costs

- Engaging contractors more closely in the mine planning and design might result in identifying cost-reductions.
- Mining costs may be reduced by WVM deciding to operate the mine using their own equipment and employees, thus avoiding paying the contractor's profit. The increase in initial and sustaining capital for mining equipment might be mitigated by leasing equipment.
- Additional geotechnical studies might result in pit slopes being steepened at Hasbrouck Mine, leading to a smaller amount of waste rock to be mined per ton of ore. Geotechnical information gained from mining operations at Three Hills may help geotechnical understanding of the Hasbrouck Mine in common geotechnical domains, which may allow for further steepening of the Hasbrouck Mine pit slopes.

Potential to Increase Metallurgical Efficiency

- HPGR crushing and micro-fracturing performance might be understated in the laboratory due to the very short time that samples take to be crushed by the laboratory-scale HPGR, typically measured in seconds or, for larger samples, several minutes. Such short runs do not allow time to optimize HPGR settings. It is expected that under steady state running at full-scale, fine tuning of crushing parameters, such as the amount of choke feeding, recirculation, roll rotation speed, and roll closing force, will result in greater efficiency in crushing and micro-fracturing which in turn will result in higher gold and silver recovery than indicated by laboratory scale tests.

- Faster gold recovery from solution, and hence more efficient operation, might be achieved at the Hasbrouck Mine by increasing the number of carbon columns in the adsorption plant from 5 to 6.
- Additional metal recovery from both the Three Hills and Hasbrouck mines might occur beyond the leach cycle time assumed in this study.

Potential to Decrease Processing Construction Costs

- The overall design of the crushing and screening plant presented in this study is a first-pass design and was not reviewed by other equipment suppliers. The opportunity exists to optimize the crushing and screening plant general arrangement and individual components, with the help of other equipment suppliers' input. Areas that are especially targeted for review include the configuration of grizzlies at the primary crusher (both static and vibrating), and conveyor layouts to and from the secondary crushers.
- A pug mill was included in the Hasbrouck Mine process plant to address the concern that the HPGR might produce "cake" rather than granular particles, which might occur when there is sufficient clay-sized material and moisture in the HPGR feed. Caked material would tend to reduce agglomeration and access of solutions to the ore once place in the heap. Planning to pass all crushed ore through the pug mill, as has been assumed in this study, is conservative as in reality the pug mill will only be required under moist conditions when clay is present in the ore, which is a small percentage of the time; for the majority of the time ore can by-pass the pug mill, with mixing of cement and ore being achieved at the various conveyor transfer points. Reducing the operating time of the pug mill would reduce operating costs.
- The various construction and capital equipment costs used in this study are based on budget costs obtained from one source in each case. It is possible that lower costs might be achieved by competitive bidding.
- The earthworks component of civil construction might be performed in part, or all, by mining equipment. This could reduce construction costs as mining equipment tends to operate at lower unit costs than civil equipment. Additionally, using mining equipment might eliminate the need for mobilization and de-mobilization of construction equipment, which would offer further cost savings.

Potential to Decrease Processing Operating Costs

- Predicted consumption of cyanide at the Three Hills and Hasbrouck mines was based on data from column leach tests using 500 ppm NaCN concentrations. It is common in many heap leach operations to utilize a lower cyanide concentration than predicted by laboratory-scale testing. Typical field concentrations can be in the range of 125-250 ppm where the ore is relatively free of significant cyanide-consuming constituents. Actual consumption may be lower than has been assumed in this study; a lower cyanide concentration would lead to lower operating costs.
- It may be possible to reduce operating costs by optimizing crew rotations and hours.

Mobile equipment has been included in the Hasbrouck crushing circuit design. A thorough review of the crushing system using stationary equipment could identify possible design changes that could result in lower operating costs.

26.0 RECOMMENDATIONS

At Three Hills some additional studies may improve value, which include: additional drilling to convert Inferred material to a higher classification; detailed bids from mining contractors may reduce mining costs; additional geotechnical studies to steepen pit slopes; and compacted permeability tests during operations. Metallurgical testing to confirm permeability is recommended.

Other than capital included in the PFS for additional studies to be completed, RESPEC makes the following recommendations for studies in advance of commencing construction and operation at the Hasbrouck Mine as shown in Table 26-1. Metallurgical testing is recommended to confirm the effect of HPGR crushing on variability samples. The estimated costs of the recommendations total $910,000.

Table 26-1 Cost Estimate for Recommendations

Three Hills Metallurgy Test Work	$ 50,000
Hasbrouck Mine Metallurgy Test Work	$ 500,000
Hasbrouck Mine Geotechnical Work	$ 360,000
Total Recommended Budget	**$ 910,000**

26.1 MINERAL RESOURCE UPGRADE

Additional exploration drilling is not included in the immediate production recommendations. However, Three Hills might benefit from additional drilling to the east and northeast of the main deposit in the future, and there is potential for Mineral Resource expansion along trend to the west and east at Hasbrouck Mine.

Mineral Resources should be updated during operations if additional exploration drilling is performed. The cost of this type of work has not been included in the recommendations or cash-flow model.

26.2 MINING

Mining contractors should provide full proposals for costs based on a fuller understanding of the project in order that efficiencies may be identified. A study of a leased, owner-operated fleet should be completed to compare with contract mining costs to select the option that provides the maximum return on investment.

26.3 PIT SLOPE CONFIRMATION AND STEEPENING

Golder Associates recommended that further geotechnical studies be performed at the Hasbrouck Mine to raise confidence in predicted pit slopes to feasibility level for the deposit, and to potentially steepen currently conservatively assumed pit slopes. Three Hills Mine pit slopes were intentionally designed using flatter slopes than the Golder Associates recommendations as a conservative measure. Golder Associates' recommended work does not include further drilling at Three Hills Mine, but involves certain field work and a review of existing core, which could result in steeper slopes there, should WVM decide to carry out the studies. At the Hasbrouck Mine, recommended work includes drilling four diamond drill holes and associated field work and engineering studies. The slope parameters used in this study are conservatively chosen due to the amount of available information.

26.4 METALLURGICAL TESTING

Tests should be performed on core samples at depth to confirm the permeability of the Three Hill material.

The predicted gold recovery at Hasbrouck is extrapolated based on the effect of HPGR crushing of a composite sample. Variability sampling is required to ensure what effect of HPGR crushing can be applied to the Mineral Resource material.

26.5 PROCESSING

The crushing circuit design should be reviewed. Using permanently installed equipment versus mobile equipment should be examined to maximize circuit availability.

26.6 CRUSHING AND SCREENING PLANT OPTIMIZATION

The overall design of the crushing and screening plant presented in this study is a first-pass design and was not reviewed by equipment suppliers. The opportunity exists to optimize the crushing and screening plant general arrangement with the help of equipment suppliers' input, which may lead to lower capital and operating costs. Areas that are targeted for this analysis include the configuration of grizzlies at the primary crusher (both static and vibrating), and conveyor layouts to and from the secondary crushers.

26.7 HPGR SIZE

The HPGR model selected for this study was a first-pass choice. It is possible that a larger machine would allow greater recirculation, which would result in finer product size and hence greater gold and silver recovery. Further test work is recommended to select the optimum size HPGR.

HPGR machine specifications and operating costs should be confirmed by further testing, including abrasion and power-consumption studies.

26.8 HASBROUCK PUG MILL

Tests are recommended to determine the probability of "cake" being produced by the HPGR under various conditions of clay content and moisture, and hence confirm or otherwise eliminate the need for a pug mill.

26.9 HASBROUCK MINE ADSORPTION PLANT

Analysis is recommended to select the optimum numbers, size, and configuration of carbon columns in the Hasbrouck Mine adsorption plant.

26.10 USED EQUIPMENT

The purchase or security of used equipment is recommended, allowing the cost of such equipment to be used in future studies of the project.

26.11 CIVIL CONSTRUCTION USING MINING EQUIPMENT

Mining contractors should be approached for budget prices for the earthworks component of civil construction to establish if cost savings might be made in this way.

26.12 WATER SUPPLY

Hasbrouck ProjectContinue water rights acquisition and permitting for long-term water supply for the project.

26.13 ENVIRONMENTAL

Permitting should continue for the Hasbrouck mines, with the target of obtaining key construction and operating permits as needed to maintain the project schedule.

27.0 REFERENCES

Albert, T., 2014 (August), *Comminution Testing Hasbrouck Project, ALS Metallurgy Report No. KM4430*: unpublished report prepared by Kappes, Cassiday and Associates for West Kirkland Mining (USA), 14 p.

Barnett, S., 1989, *Monthly Progress Report For March 1989*, internal Corona Gold Inc. report.

Bechtel, Inc., 1986, untitled report on the Hasbrouck Project.

Bonham, H.F., and Garside, L.J., 1974, *Guidebook to the Geology of Four Tertiary Volcanic Centers in Central Nevada*: Nevada Bureau of Mines and Geology Report 19, 72 p.

Bonham H.F., and Garside L.J., 1979, *Geology of the Tonopah, Lone Mountain, Klondike, and Northern Mud Lake Quadrangles, Nevada*: Nevada Bureau of Mines and Geology; Bulletin 92, 142 p.

Bonham H.F., Garside L.J., and Carraher, R., 1987, Precious metal deposits in SE California and south- and west-central Nevada, in: Johnson, J. L., ed., Guidebook for Field Trips of the Symposium on Bulk Mineable Precious Metal Deposits of the Western United States, Geological Society of Nevada, p. 65-136.

Carter, G., 2011, *Allied Nevada Gold Corp's Hasbrouck Mountain Project: Geology, Alteration, and Mineralization*: North West Mining Association 2011 Annual Meeting, Prospector's Forum abstract and presentation, December 2011.

Couch, B.F. and Carpenter, J.A., 1943, *Nevada's metal and mineral production (1859-1940 inclusive)*: Nevada Bureau of Mines and Geology Bulletin 38.

Cofer, R.S., 1989, *Hasbrouck Peak Project (Y006) Final Report, Esmeralda County, Nevada*: FMC Minerals Corp. internal report, 12 p.

Dyer, T.L., Tietz, P. Osborne, ,H., Baker, R., and Defilippi, C., 2016, *Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada*: Technical Report prepared by Mine Development Associates for West Kirkland Mining Inc.

Flint, D.C., Gorman, M.G., Kunkel, K., Moore, D.B., Wilson, S.E., 2012 (April), *Hasbrouck Property NI43-101 Technical Report*, Allied Nevada Gold Corp., 126 p.

Golder Associates, 2015 (January), Hasbrouck Project, Esmeralda County, Nevada, Pre-feasibility Level Pit Slope Evaluation: unpublished report prepared by Golder Associates for West Kirkland Mining Inc., 387 p.

Graney, J.R., 1985, *Geology, Alteration, and Mineralization at Hasbrouck Mountain, Divide District, Esmeralda County, Nevada*: MSc Thesis, University of Nevada Reno, 105 p.

Hardy, S., 1996 (November), *Three Hills Project, Resource Evaluation*: unpublished report prepared by Mine Development Associates for Eastfield Resources Inc., and Prism Resources Inc.

Hardy, S., and Ristorcelli, S.J., 1996 (November), Hill of Gold Project, Resource Evaluation: unpublished report prepared by Mine Development Associates for Eastfield Resources (USA) Inc., and Prism Resources (US) Inc., 47 p.

Hazen Research Inc., 1989, *Mineralogy of Twelve Gold Ore Samples*: report cited in Prenn, N.B. and Gustin, M.M., 2006, Updated Technical Report Hasbrouck Project Esmeralda County, Nevada USA: unpublished Technical Report prepared by Mine Development Associates for Allied Nevada Gold Corp. and Vista Gold Corp.

Kappes, Cassiday and Associates, 2015 (March), *Three Hills Project, Report of Metallurgical Test Work, March 2015, Project No. 8905C, Report KCA0140082_TH03-01*, 101 p.

Kunkel, K.W., 2012, *Hasbrouck Mountain Geology and Mineralization*: Society for Mining, Metallurgy, and Exploration, 2012 Annual Meeting, Abstract and Presentation, Seattle, Washington, February 2012.

McClelland, G.E., 1996 (November), *Report on Heap Leach Cyanidation Evaluation - Three Hills and Hill of Gold Drill Core Composites, MLI Job No. 2335*: unpublished report by McClelland Laboratories Inc., prepared for Eastfield Resources, 37 p.

McPartland, J.S., 2012, (March), *Report on Heap Leach and Milling/Cyanidation Testing - Hasbrouck Drill Core Composites MLI No. 3536*: unpublished report by McClelland Laboratories Inc., prepared for Allied Nevada Gold Corp., 264 p.

Panteleyev, A., 1996, *Hot-spring Au-Ag*: *in* Selected British Columbia Mineral Deposit Profiles, Volume 2 - Metallic Deposits, *ed*. D.V. Lefebure, and T. Hõy, British Columbia Ministry of Employment and Investment, Open File 1996-13, pp. 33–36.

Prenn, N.B., 2003 (August), *Technical Report, Three Hills Project, Esmeralda County, Nevada USA*: Technical Report prepared by Mine Development Associates for Vista Gold Corp., 61 p., plus appendices.

Prenn, N.B. and Gustin, M.M., 2003 (August), *Technical Report Hasbrouck Project, Esmeralda County, Nevada USA*: Technical Report prepared by Mine Development Associates for Vista Gold Corp., 81 p., plus appendices.

Prenn, N.B. 2006 (August), *Updated Technical Review, Three Hills Project, Esmeralda County, Nevada USA*: Technical Report prepared by Mine Development Associates for Allied Nevada Gold Corp. and Vista Gold Corp., 63 p., plus appendices.

Prenn, N.B. and Gustin, M.M., 2006 (August), *Updated Technical Report, Hasbrouck Project, Esmeralda County, Nevada, USA*: Technical Report prepared by Mine Development Associates for Allied Nevada Gold Corp. and Vista Gold Corp., 82 p., plus appendices.

Snyder, K., 1990, *Hasbrouck Geophysical Program*: unpublished internal memorandum, Euro-Nevada Mining Corp. Ltd.

Stewart, 1988 Stewart, J.H., 1988. *Tectonics of the Walker Lane Belt, western Great Basin Mesozoic and Cenozoic deformation in a zone of shear:* in Ernst, W.G. (Ed.), Metamorphism and Crustal Evolution of the Western US, Ruby Volume VII. Prentice Hall, Englewood Cliffs, NJ, pp. 685–713.

Thompson, R., 1999, *Mineralization Associated with Rhyolitic Volcanic Events in the Tonopah Area, Esmeralda and Nye Counties, Nevada*: MSc Thesis, Colorado School of Mines.

Tietz, P., Dyer, T.L., Osborne, ,H., and Defilippi, C., 2015, *Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada*: Technical Report prepared by Mine Development Associates for West Kirkland Mining Inc., 336 p.

Tietz, P., Dyer, T.L., Osborne, ,H., and Defilippi, C., 2016, *Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada*: Technical Report prepared by Mine Development Associates for West Kirkland Mining Inc., 381 p.

Tregaskis, S. W. and Garratt, G. L. (1996), *Tonopah Project, Esmeralda County, Nevada, 1996 Summary Report for Eastfield Resources Inc. and Prism Resources Inc.*; Mincord Exploration Consultants LTD.;

Tregaskis, S.W. and Garratt, G.L. 1998, *Tonopah Project, Esmeralda County, Nevada, 1997, Summary Report:* unpublished report prepared by Mincord Exploration Consultants Ltd., for Eastfield Resources Inc. and Prism Resources Inc.

Wellman, E., 2015 (February), *Technical Memorandum on the Hasbrouck Project Geotech PFS Review*, prepared for West Kirkland Mining by SRK Consulting, 3 p.

Wilson, S.E., 2014 (February), *Technical Report for the Hasbrouck and Three Hills Project, Esmeralda County, Nevada, USA*: Technical Report prepared by Metal Mining Consultants for West Kirkland Mining Inc., 100 p.

Wittkopp, R. W., 1982, *Silver Occurrences in Samples THA-13, THA-50, H2 225'-235', H2 325'-335' and 2189-D, from Hasbrouck, Nevada*: internal document of Cordex Exploration Company.

Wright, J., 2010 (October), *Hasbrouck Property Gravity Survey*: unpublished report for Allied Nevada Gold Corp.

Wright, J., 2011a, *Hasbrouck Property Gravity Survey - III*: unpublished report for Allied Nevada Gold Corp.

Wright, J., 2011b (May), *Hasbrouck Property CSAMT Survey*: unpublished report for Allied Nevada Gold Corp.

Wright, J.W., 2012 (March), *Report on Heap Leach and Milling/Cyanidation Testing Hasbrouck Drill Core Composite MLI Job No. 3465*: unpublished report by McClelland Laboratories Inc., prepared for Allied Nevada Gold Corp., 187 p..

28.0 REFERENCES

Effective Date of report: February 11, 2023

Completion Date of report: March 6, 2023Error! Reference source not found.

"Jeff Bickel"
Jeff Bickel
Date Signed: March 6, 2023

"Thomas L. Dyer"
Thomas L. Dyer, P.E.
Date Signed: March 6, 2023

"Mark Jorgensen"
Date Signed: March 6, 2023

"Ryan T. Baker"
Ryan T. Baker
Date Signed: March 6, 2023

"Carl E. Defilippi"
Carl E. Defilippi
Date Signed: March 6, 2023

Table 28-1 List of Responsibilities of Qualified Persons

Technical Report Section	Company	Responsible Qualified Persons
1 Executive Summary	RESEC, KCA, NewFields, JE&TS	Sign-off by Section
2 Introduction	RESPEC	Jeff Bickel
3 Reliance on Other Experts	RESPEC	Jeff Bickel
4 Property Description and Location	RESPEC	Jeff Bickel
5 Accessibility, Physiography, Climate Local Resources and Infrastructure	RESPEC	Jeff Bickel
6 History	RESPEC	Jeff Bickel
7 Geologic Setting and Mineralization	RESPEC	Jeff Bickel
8 Deposit Types	RESPEC	Jeff Bickel
9 Exploration	RESPEC	Jeff Bickel
10 Drilling	RESPEC	Jeff Bickel
11 Sample Preparation, Analyses, and Security	RESPEC	Jeff Bickel
12 Data Verification	RESPEC	Jeff Bickel
13 Metallurgical Testing and Mineral Processing	JE&TS	Mark Jorgensen
14 Mineral Resources	RESPEC	Jeff Bickel
15 Mineral Reserve Estimates	RESPEC	Thomas Dyer
16 Mining Methods	RESPEC	Thomas Dyer
17 Recovery Methods	KCA, NewFields	Carl Defilippi, Ryan Baker
18 Project Infrastructure	NewFields, RESPEC, KCA	Ryan Baker, Carl Defilippi, Thomas Dyer
19 Market Studies and Contracts	RESPEC	Thomas Dyer
20 Environmental Studies, Permitting, and Social or Community Impact	RESPEC	Jeff Bickel, Thomas Dyer
21 Capital and Operating Costs	RESPEC	Thomas Dyer, Carl Defilippi, Ryan Baker
22 Economic Analysis	RESPEC	Thomas Dyer
23 Adjacent Properties	RESPEC	Jeff Bickel
24 Other Relevant Data and Information	RESPEC	Thomas Dyer
25 Interpretations and Conclusions	RESPEC, KCA, NewFields, JE&TS	Sign-off by Section
26 Recommendations	RESPEC, KCA, NewFields, JE&TS	Sign-off by Section
27 References	RESPEC	Jeff Bickel

29.0 CERTIFICATE OF QUALIFIED PERSON

CERTIFICATE OF QUALIFIED PERSON

JEFF BICKEL, C.P.G.

I, Jeff Bickel, C.P.G., do hereby certify that:

1. I am currently employed as Senior Geologist for RESPEC, Inc. located at 210 South Rock Blvd., Reno, Nevada 89502 and

2. I graduated with a Bachelor of Science degree in Geological Sciences from Arizona State University in 2010 and have been continuously employed in the mining industry since graduation.

3. I am a Certified Professional Geologist (# 12050) with the American Institute of Professional Geologists and a Registered Member of the Society of Mining, Metallurgy, and Exploration (4184632RM). I have worked as a geologist in the mining industry for more than 12 years.

4. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101"). I have previously explored, drilled, evaluated, and modelled similar gold and silver deposits in volcanic rocks in Nevada. I certify that by reason of my education, affiliation with certified Professional Associations, and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.

5. I am one of the authors of the technical report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* prepared for West Vault Mining Inc., dated effective January 11, 2023 (the "Technical Report"). Subject to those issues discussed in Section 3.0, I am responsible for Sections 2 through 12, 14, 23, and 27, and take co-responsibility for Sections 1, 20, 25, and 26 of the Technical Report. I visited the Hasbrouck Project site on September 12, 2022.

6. To the best of my knowledge, information and belief, the technical report contains the necessary scientific and technical information to make the technical report not misleading.

7. I am independent of West Vault Mining Inc. and related companies applying all of the tests in Section 1.5 of National Instrument 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.

8. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements of that instrument and form.

9. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this March 6, 2023.

"Jeffrey Bickel"

Signature of Qualified Person

Jeffrey Bickel

Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

THOMAS L. DYER, P.E.

I, Thomas Dyer, P. E., do hereby certify that I am currently employed as Senior Engineer by RESPEC, Inc., 210 South Rock Blvd., Reno, Nevada 89502 and:

1. I graduated with a Bachelor of Science degree in Mine Engineering from South Dakota School of Mines & Technology in 1996. I have worked as a Mining Engineer for 26 years since graduation. During my Engineering career I have held various positions of increasing responsibility at operating mines performing life of mine planning and cost estimates. During the last 15 years I have been engaged in consulting on various lead, zinc, gold, silver, copper, and limestone deposits both for underground and open pit operations. This consulting work has primarily consisted of providing production schedules, mine cost estimates, and cash-flow analysis.

2. I am registered as a Professional Engineer – Mining in the State of Nevada (# 15729). I am also a Registered Member of SME (# 4029995RM) in good standing.

3. 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. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am one of the authors of the Technical Report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective January 11, 2023 (the "Technical Report"). I am responsible for the preparation of sections 15, 16, 19, 22, and 24, and portions of sections 1, 18, 20, 21, 25, and 26, subject to those issues discussed in Section 3.0. I have most recently visited the property on September 12, 2022, to review current infrastructure and scope out future infrastructure and road requirements.

5. I have had prior involvement with the Hasbrouck Project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective November 1, 2016.

6. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

8. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this March 6, 2023

"Thomas L. Dyer"

Signature of Qualified Person

Thomas L. Dyer

Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

MARK K. JORGENSEN

I, Mark K. Jorgensen, do hereby certify that I am currently employed as a Principal Consultant for Jorgensen Engineering and Technical Services (JE&TS), located at 1230 E Jamison Ave., Centennial, CO 80122 and:

1. I am a graduate of the University of Nevada (Reno) in 1977 with a Bachelor of Science degree in Chemical Engineering.
2. I am a Qualified Professional (Q.P.) in Metallurgy (Member Number 012020QP) with the Mining and Metallurgical Society of America. I have flotation plant experience. I have designed flotation test programs, designed flotation operating plants and worked in flotation operating plants.
3. I have read the definition of "Qualified Person" set out in National Instrument 43-101 and certify that by reason of education, experience, independence and affiliation with a Professional Association, I meet the requirements of an Independent Qualified Person as defined in National Policy 43-101.
4. I am responsible or jointly responsible for Section 1, Executive Summary and Section 13, Mineral Processing and Metallurgical Testing of this technical report titled "*Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project Esmeralda County, Nevada*", with an Effective Date of January 11, 2023.
5. The work was completed during the period September 2022 to February 2023. I toured and visited the Hasbrouck and Three Hills property in September 2022 for one day.
6. I have not worked previously on this project or property.
7. I am not aware of any material fact or material change with respect to the subject matter of the technical report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
8. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
9. I have read National Instrument 43-101 and Form 43-101 FI, and the Technical Report has been prepared in compliance with that instrument and form.
10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this March 6, 2023

"Mark K. Jorgensen"

Signature of Qualified Person

Mark K. Jorgensen

Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

RYAN T. BAKER

I, Ryan T. Baker, do hereby certify that I am currently employed as Principal Engineer by NewFields Mining Design & Technical Services, LLC, with a business address of 9400 Station Street, Suite 300, Lone Tree, CO 80124 and:

1. I am a graduate of Colorado State University with a Bachelor of Science degree in Civil Engineering (1993). I am a registered Professional Engineer in Nevada (#13947), Alaska (#11172), Idaho (#10226), Colorado (#36988), Missouri (PE2008000049), and New Mexico (#22110). I am a Registered Member of the Society for Mining, Metallurgy, and Exploration (SME, #4204584) and the American Society of Civil Engineers (ASCE, #307827). My relevant experience includes heap leach and tailings storage facility and mine surface infrastructure design and inspection since 1994.

2. 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.

3. I am responsible for preparing portions of Sections 17, 18, and 21 of the Technical Report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective January 11, 2023 (the "Technical Report"), and I am co-responsible for portions of Section 1. I visited the Hasbrouck Mine and Three Hills Mine sites on May 1, 2014.

4. I have had prior involvement with the Hasbrouck Project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015. I was one of the authors of the technical report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective November 1, 2016.

5. As for 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.

6. I am independent of West Vault Mining Inc. and related companies applying all of the tests in Section 1.5 of National Instrument 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.

7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements of that instrument and form.

8. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this March 6, 2023

"Ryan T. Baker"

Signature of Qualified Person

Ryan T. Baker

Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

CARL E. DEFILIPPI

I, Carl E. DefilippiCarl E. Defilippi, M.Sc., RM SME, do hereby certify that I am currently employed as Senior Engineer for Kappes, Cassiday & Associates located at 7950 Security Circle, Reno, Nevada 89506 and:

1. I graduated with a Bachelor of Science degree in Chemical Engineering from the University of Nevada in 1978 and a Master of Science degree in Metallurgical Engineering from the University of Nevada in 1981.

2. I am a Registered Member of the Society for Mining, Metallurgy and Exploration (775870 RM) and I have worked as a Metallurgical Engineer for 36 years.

3. 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.

4. I am independent of West Vault Mining Ltd. and related companies applying all of the tests in section 1.5 of National Instrument 43-101. I participated in a scoping study on Hasbrouck for Allied Nevada in 2011.

5. I am responsible for Section 17 (except 17.1.6.2 and 17.2.9), Sections 18.1.10.1, 18.1.10.2, 18.2.2, 18.2.3, and applicable sections of 1, 21, 25, 26 and 27 of the Technical Report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective January 11, 2023 (the "Technical Report"). I visited the Three Hills and Hasbrouck Project sites on May 1, 2014 and January 31, 2023.

6. I have had prior involvement with the Hasbrouck Project that is subject to this Report. I am one of the authors of the Technical Report entitled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"*, prepared for West Vault Mining Inc., dated effective November 1, 2016. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015.

7. As of the Effective Date of this Technical Report, to the best of my knowledge, information and belief, the part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

8. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements that Instrument and Form.

9. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report

Dated this March 6, 2023

"Carl Defillipi"
Signature of Qualified Person

Carl Defillipi
Print Name of Qualified Person

APPENDIX A

LIST OF CLAIMS FOR THE HASBROUCK PROJECT

A.1. LIST OF HASBROUCK PROJECT UNPATENTED CLAIMS

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	BELCHER 4	NV101564517	ESMERALDA
Hasbrouck Mtn	BELCHER 5	NV101564518	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 1	NV101789086	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 10	NV101789095	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 11	NV101789096	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 2	NV101789087	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 3	NV101789088	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 4	NV101789089	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 5	NV101789090	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 6	NV101789091	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 7	NV101789092	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 8	NV101789093	ESMERALDA
Hasbrouck Mtn	EHOG LODE CLAIM 9	NV101789094	ESMERALDA
Hasbrouck Mtn	FF 1	NV101375162	ESMERALDA
Hasbrouck Mtn	FF 10	NV101375877	ESMERALDA
Hasbrouck Mtn	FF 11	NV101375878	ESMERALDA
Hasbrouck Mtn	FF 12	NV101375879	ESMERALDA
Hasbrouck Mtn	FF 13	NV101375880	ESMERALDA
Hasbrouck Mtn	FF 14	NV101375881	ESMERALDA
Hasbrouck Mtn	FF 15	NV101375882	ESMERALDA
Hasbrouck Mtn	FF 16	NV101375883	ESMERALDA
Hasbrouck Mtn	FF 17	NV101375884	ESMERALDA
Hasbrouck Mtn	FF 19	NV101375885	ESMERALDA
Hasbrouck Mtn	FF 2	NV101375163	ESMERALDA
Hasbrouck Mtn	FF 20	NV101375886	ESMERALDA
Hasbrouck Mtn	FF 21	NV101375887	ESMERALDA
Hasbrouck Mtn	FF 22	NV101375888	ESMERALDA
Hasbrouck Mtn	FF 3	NV101375164	ESMERALDA
Hasbrouck Mtn	FF 4	NV101375165	ESMERALDA
Hasbrouck Mtn	FF 5	NV101375166	ESMERALDA
Hasbrouck Mtn	FF 6	NV101375167	ESMERALDA
Hasbrouck Mtn	FF 7	NV101375875	ESMERALDA
Hasbrouck Mtn	FF 8	NV101375876	ESMERALDA
Hasbrouck Mtn	FF 9	NV101872613	ESMERALDA
Hasbrouck Mtn	HAS 1	NV101882755	ESMERALDA
Hasbrouck Mtn	HAS 10	NV101882759	ESMERALDA
Hasbrouck Mtn	HAS 11	NV101872619	ESMERALDA
Hasbrouck Mtn	HAS 12	NV101872620	ESMERALDA
Hasbrouck Mtn	HAS 13	NV101872621	ESMERALDA
Hasbrouck Mtn	HAS 14	NV101872622	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HAS 15	NV101872623	ESMERALDA
Hasbrouck Mtn	HAS 16	NV101882760	ESMERALDA
Hasbrouck Mtn	HAS 17	NV101882761	ESMERALDA
Hasbrouck Mtn	HAS 18	NV101882762	ESMERALDA
Hasbrouck Mtn	HAS 19	NV101882763	ESMERALDA
Hasbrouck Mtn	HAS 2	NV101872614	ESMERALDA
Hasbrouck Mtn	HAS 20	NV101883566	ESMERALDA
Hasbrouck Mtn	HAS 21	NV101883567	ESMERALDA
Hasbrouck Mtn	HAS 22	NV101883568	ESMERALDA
Hasbrouck Mtn	HAS 23	NV101883569	ESMERALDA
Hasbrouck Mtn	HAS 24	NV101883570	ESMERALDA
Hasbrouck Mtn	HAS 25	NV101883571	ESMERALDA
Hasbrouck Mtn	HAS 26	NV101883572	ESMERALDA
Hasbrouck Mtn	HAS 27	NV101883573	ESMERALDA
Hasbrouck Mtn	HAS 28	NV101883574	ESMERALDA
Hasbrouck Mtn	HAS 29	NV101883575	ESMERALDA
Hasbrouck Mtn	HAS 3	NV101872615	ESMERALDA
Hasbrouck Mtn	HAS 30	NV101883576	ESMERALDA
Hasbrouck Mtn	HAS 31	NV101883577	ESMERALDA
Hasbrouck Mtn	HAS 32	NV101883578	ESMERALDA
Hasbrouck Mtn	HAS 33	NV101883579	ESMERALDA
Hasbrouck Mtn	HAS 34	NV101883580	ESMERALDA
Hasbrouck Mtn	HAS 35	NV101883581	ESMERALDA
Hasbrouck Mtn	HAS 36	NV101883582	ESMERALDA
Hasbrouck Mtn	HAS 37	NV101883583	ESMERALDA
Hasbrouck Mtn	HAS 38	NV101883584	ESMERALDA
Hasbrouck Mtn	HAS 39	NV101883585	ESMERALDA
Hasbrouck Mtn	HAS 4	NV101872616	ESMERALDA
Hasbrouck Mtn	HAS 40	NV101883586	ESMERALDA
Hasbrouck Mtn	HAS 41	NV101884379	ESMERALDA
Hasbrouck Mtn	HAS 42	NV101884380	ESMERALDA
Hasbrouck Mtn	HAS 43	NV101884381	ESMERALDA
Hasbrouck Mtn	HAS 44	NV101884382	ESMERALDA
Hasbrouck Mtn	HAS 45	NV101884383	ESMERALDA
Hasbrouck Mtn	HAS 46	NV101884384	ESMERALDA
Hasbrouck Mtn	HAS 47A	NV101872624	ESMERALDA
Hasbrouck Mtn	HAS 47B	NV101872625	ESMERALDA
Hasbrouck Mtn	HAS 48	NV101884385	ESMERALDA
Hasbrouck Mtn	HAS 49A	NV101872626	ESMERALDA
Hasbrouck Mtn	HAS 49B	NV101872627	ESMERALDA
Hasbrouck Mtn	HAS 5	NV101872617	ESMERALDA
Hasbrouck Mtn	HAS 50	NV101884386	ESMERALDA
Hasbrouck Mtn	HAS 51	NV101884387	ESMERALDA
Hasbrouck Mtn	HAS 52	NV101884388	ESMERALDA
Hasbrouck Mtn	HAS 53	NV101884389	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HAS 54	NV101884390	ESMERALDA
Hasbrouck Mtn	HAS 55	NV101884391	ESMERALDA
Hasbrouck Mtn	HAS 56	NV101884392	ESMERALDA
Hasbrouck Mtn	HAS 57	NV101884393	ESMERALDA
Hasbrouck Mtn	HAS 58	NV101884394	ESMERALDA
Hasbrouck Mtn	HAS 59	NV101884395	ESMERALDA
Hasbrouck Mtn	HAS 6	NV101872618	ESMERALDA
Hasbrouck Mtn	HAS 7	NV101882756	ESMERALDA
Hasbrouck Mtn	HAS 8	NV101882757	ESMERALDA
Hasbrouck Mtn	HAS 9	NV101882758	ESMERALDA
Hasbrouck Mtn	HOG 1	NV101710826	ESMERALDA
Hasbrouck Mtn	HOG 10	NV101710835	ESMERALDA
Hasbrouck Mtn	HOG 11	NV101710836	ESMERALDA
Hasbrouck Mtn	HOG 12	NV101710837	ESMERALDA
Hasbrouck Mtn	HOG 13	NV101710838	ESMERALDA
Hasbrouck Mtn	HOG 14	NV101710839	ESMERALDA
Hasbrouck Mtn	HOG 15	NV101710840	ESMERALDA
Hasbrouck Mtn	HOG 16	NV101710841	ESMERALDA
Hasbrouck Mtn	HOG 17	NV101710842	ESMERALDA
Hasbrouck Mtn	HOG 18	NV101711822	ESMERALDA
Hasbrouck Mtn	HOG 19	NV101711823	ESMERALDA
Hasbrouck Mtn	HOG 2	NV101710827	ESMERALDA
Hasbrouck Mtn	HOG 20	NV101711824	ESMERALDA
Hasbrouck Mtn	HOG 21	NV101711825	ESMERALDA
Hasbrouck Mtn	HOG 3	NV101710828	ESMERALDA
Hasbrouck Mtn	HOG 4	NV101710829	ESMERALDA
Hasbrouck Mtn	HOG 5	NV101710830	ESMERALDA
Hasbrouck Mtn	HOG 6	NV101710831	ESMERALDA
Hasbrouck Mtn	HOG 7	NV101710832	ESMERALDA
Hasbrouck Mtn	HOG 8	NV101710833	ESMERALDA
Hasbrouck Mtn	HOG 9	NV101710834	ESMERALDA
Hasbrouck Mtn	HSB 1	NV101375566	ESMERALDA
Hasbrouck Mtn	HSB 10	NV101375575	ESMERALDA
Hasbrouck Mtn	HSB 100	NV101436581	ESMERALDA
Hasbrouck Mtn	HSB 101	NV101436582	ESMERALDA
Hasbrouck Mtn	HSB 102	NV101436583	ESMERALDA
Hasbrouck Mtn	HSB 103	NV101436584	ESMERALDA
Hasbrouck Mtn	HSB 104	NV101436585	ESMERALDA
Hasbrouck Mtn	HSB 105	NV101436586	ESMERALDA
Hasbrouck Mtn	HSB 106	NV101436587	ESMERALDA
Hasbrouck Mtn	HSB 107	NV101436588	ESMERALDA
Hasbrouck Mtn	HSB 108	NV101436589	ESMERALDA
Hasbrouck Mtn	HSB 109	NV101436590	ESMERALDA
Hasbrouck Mtn	HSB 11	NV101375576	ESMERALDA
Hasbrouck Mtn	HSB 110	NV101436591	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 111	NV101436592	ESMERALDA
Hasbrouck Mtn	HSB 112	NV101436593	ESMERALDA
Hasbrouck Mtn	HSB 113	NV101436594	ESMERALDA
Hasbrouck Mtn	HSB 114	NV101436595	ESMERALDA
Hasbrouck Mtn	HSB 115	NV101436596	ESMERALDA
Hasbrouck Mtn	HSB 116	NV101436597	ESMERALDA
Hasbrouck Mtn	HSB 117	NV101436598	ESMERALDA
Hasbrouck Mtn	HSB 118	NV101436599	ESMERALDA
Hasbrouck Mtn	HSB 119	NV101436600	ESMERALDA
Hasbrouck Mtn	HSB 12	NV101375577	ESMERALDA
Hasbrouck Mtn	HSB 120	NV101370797	ESMERALDA
Hasbrouck Mtn	HSB 121	NV101370798	ESMERALDA
Hasbrouck Mtn	HSB 122	NV101370799	ESMERALDA
Hasbrouck Mtn	HSB 123	NV101370800	ESMERALDA
Hasbrouck Mtn	HSB 124	NV101371359	ESMERALDA
Hasbrouck Mtn	HSB 125	NV101371360	ESMERALDA
Hasbrouck Mtn	HSB 126	NV101371361	ESMERALDA
Hasbrouck Mtn	HSB 127	NV101371362	ESMERALDA
Hasbrouck Mtn	HSB 128	NV101371363	ESMERALDA
Hasbrouck Mtn	HSB 129	NV101371364	ESMERALDA
Hasbrouck Mtn	HSB 13	NV101375578	ESMERALDA
Hasbrouck Mtn	HSB 130	NV101371365	ESMERALDA
Hasbrouck Mtn	HSB 131	NV101371366	ESMERALDA
Hasbrouck Mtn	HSB 132	NV101371367	ESMERALDA
Hasbrouck Mtn	HSB 133	NV101371368	ESMERALDA
Hasbrouck Mtn	HSB 134	NV101371369	ESMERALDA
Hasbrouck Mtn	HSB 135	NV101371370	ESMERALDA
Hasbrouck Mtn	HSB 136	NV101371371	ESMERALDA
Hasbrouck Mtn	HSB 137	NV101371372	ESMERALDA
Hasbrouck Mtn	HSB 138	NV101371373	ESMERALDA
Hasbrouck Mtn	HSB 139	NV101371374	ESMERALDA
Hasbrouck Mtn	HSB 14	NV101375579	ESMERALDA
Hasbrouck Mtn	HSB 140	NV101371375	ESMERALDA
Hasbrouck Mtn	HSB 141	NV101371376	ESMERALDA
Hasbrouck Mtn	HSB 142	NV101371377	ESMERALDA
Hasbrouck Mtn	HSB 143	NV101371378	ESMERALDA
Hasbrouck Mtn	HSB 144	NV101371379	ESMERALDA
Hasbrouck Mtn	HSB 145	NV101371380	ESMERALDA
Hasbrouck Mtn	HSB 146	NV101371381	ESMERALDA
Hasbrouck Mtn	HSB 147	NV101371382	ESMERALDA
Hasbrouck Mtn	HSB 148	NV101371383	ESMERALDA
Hasbrouck Mtn	HSB 149	NV101371384	ESMERALDA
Hasbrouck Mtn	HSB 15	NV101375580	ESMERALDA
Hasbrouck Mtn	HSB 150	NV101371385	ESMERALDA
Hasbrouck Mtn	HSB 151	NV101371386	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 152	NV101371387	ESMERALDA
Hasbrouck Mtn	HSB 153	NV101371388	ESMERALDA
Hasbrouck Mtn	HSB 154	NV101371389	ESMERALDA
Hasbrouck Mtn	HSB 155	NV101371390	ESMERALDA
Hasbrouck Mtn	HSB 156	NV101371391	ESMERALDA
Hasbrouck Mtn	HSB 157	NV101371392	ESMERALDA
Hasbrouck Mtn	HSB 158	NV101371393	ESMERALDA
Hasbrouck Mtn	HSB 159	NV101371394	ESMERALDA
Hasbrouck Mtn	HSB 16	NV101375581	ESMERALDA
Hasbrouck Mtn	HSB 160	NV101371395	ESMERALDA
Hasbrouck Mtn	HSB 161	NV101371396	ESMERALDA
Hasbrouck Mtn	HSB 162	NV101371397	ESMERALDA
Hasbrouck Mtn	HSB 163	NV101371398	ESMERALDA
Hasbrouck Mtn	HSB 164	NV101371399	ESMERALDA
Hasbrouck Mtn	HSB 165	NV101371400	ESMERALDA
Hasbrouck Mtn	HSB 166	NV101437120	ESMERALDA
Hasbrouck Mtn	HSB 167	NV101437121	ESMERALDA
Hasbrouck Mtn	HSB 168	NV101437122	ESMERALDA
Hasbrouck Mtn	HSB 169	NV101437123	ESMERALDA
Hasbrouck Mtn	HSB 17	NV101375582	ESMERALDA
Hasbrouck Mtn	HSB 170	NV101437124	ESMERALDA
Hasbrouck Mtn	HSB 171	NV101437125	ESMERALDA
Hasbrouck Mtn	HSB 172	NV101437126	ESMERALDA
Hasbrouck Mtn	HSB 173	NV101437127	ESMERALDA
Hasbrouck Mtn	HSB 174	NV101437128	ESMERALDA
Hasbrouck Mtn	HSB 175	NV101437129	ESMERALDA
Hasbrouck Mtn	HSB 176	NV101437130	ESMERALDA
Hasbrouck Mtn	HSB 177	NV101437131	ESMERALDA
Hasbrouck Mtn	HSB 178	NV101437132	ESMERALDA
Hasbrouck Mtn	HSB 179	NV101437133	ESMERALDA
Hasbrouck Mtn	HSB 18	NV101375583	ESMERALDA
Hasbrouck Mtn	HSB 180	NV101437134	ESMERALDA
Hasbrouck Mtn	HSB 181	NV101437135	ESMERALDA
Hasbrouck Mtn	HSB 182	NV101437136	ESMERALDA
Hasbrouck Mtn	HSB 183	NV101437137	ESMERALDA
Hasbrouck Mtn	HSB 184	NV101437138	ESMERALDA
Hasbrouck Mtn	HSB 185	NV101437139	ESMERALDA
Hasbrouck Mtn	HSB 186	NV101437140	ESMERALDA
Hasbrouck Mtn	HSB 187	NV101437141	ESMERALDA
Hasbrouck Mtn	HSB 188	NV101437142	ESMERALDA
Hasbrouck Mtn	HSB 189	NV101437143	ESMERALDA
Hasbrouck Mtn	HSB 19	NV101375584	ESMERALDA
Hasbrouck Mtn	HSB 190	NV101437144	ESMERALDA
Hasbrouck Mtn	HSB 191	NV101437145	ESMERALDA
Hasbrouck Mtn	HSB 192	NV101437146	ESMERALDA

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Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 193	NV101437147	ESMERALDA
Hasbrouck Mtn	HSB 194	NV101437148	ESMERALDA
Hasbrouck Mtn	HSB 195	NV101437149	ESMERALDA
Hasbrouck Mtn	HSB 196	NV101437150	ESMERALDA
Hasbrouck Mtn	HSB 197	NV101437151	ESMERALDA
Hasbrouck Mtn	HSB 198	NV101437152	ESMERALDA
Hasbrouck Mtn	HSB 199	NV101437153	ESMERALDA
Hasbrouck Mtn	HSB 2	NV101375567	ESMERALDA
Hasbrouck Mtn	HSB 20	NV101375585	ESMERALDA
Hasbrouck Mtn	HSB 200	NV101437154	ESMERALDA
Hasbrouck Mtn	HSB 201	NV101437155	ESMERALDA
Hasbrouck Mtn	HSB 202	NV101437156	ESMERALDA
Hasbrouck Mtn	HSB 203	NV101437157	ESMERALDA
Hasbrouck Mtn	HSB 204	NV101437158	ESMERALDA
Hasbrouck Mtn	HSB 205	NV101437159	ESMERALDA
Hasbrouck Mtn	HSB 206	NV101437160	ESMERALDA
Hasbrouck Mtn	HSB 207	NV101437161	ESMERALDA
Hasbrouck Mtn	HSB 208	NV101437162	ESMERALDA
Hasbrouck Mtn	HSB 209	NV101437163	ESMERALDA
Hasbrouck Mtn	HSB 21	NV101375586	ESMERALDA
Hasbrouck Mtn	HSB 210	NV101437164	ESMERALDA
Hasbrouck Mtn	HSB 211	NV101437165	ESMERALDA
Hasbrouck Mtn	HSB 212	NV101437166	ESMERALDA
Hasbrouck Mtn	HSB 213	NV101437167	ESMERALDA
Hasbrouck Mtn	HSB 214	NV101437168	ESMERALDA
Hasbrouck Mtn	HSB 215	NV101437169	ESMERALDA
Hasbrouck Mtn	HSB 216	NV101437170	ESMERALDA
Hasbrouck Mtn	HSB 217	NV101437171	ESMERALDA
Hasbrouck Mtn	HSB 218	NV101437172	ESMERALDA
Hasbrouck Mtn	HSB 219	NV101437173	ESMERALDA
Hasbrouck Mtn	HSB 22	NV101375587	ESMERALDA
Hasbrouck Mtn	HSB 220	NV101437174	ESMERALDA
Hasbrouck Mtn	HSB 221	NV101437175	ESMERALDA
Hasbrouck Mtn	HSB 222	NV101437176	ESMERALDA
Hasbrouck Mtn	HSB 223	NV101437177	ESMERALDA
Hasbrouck Mtn	HSB 224	NV101437178	ESMERALDA
Hasbrouck Mtn	HSB 225	NV101437179	ESMERALDA
Hasbrouck Mtn	HSB 226	NV101437180	ESMERALDA
Hasbrouck Mtn	HSB 227	NV101437181	ESMERALDA
Hasbrouck Mtn	HSB 228	NV101437182	ESMERALDA
Hasbrouck Mtn	HSB 229	NV101437183	ESMERALDA
Hasbrouck Mtn	HSB 23	NV101375588	ESMERALDA
Hasbrouck Mtn	HSB 230	NV101437184	ESMERALDA
Hasbrouck Mtn	HSB 231	NV101437185	ESMERALDA
Hasbrouck Mtn	HSB 232	NV101437186	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 233	NV101437187	ESMERALDA
Hasbrouck Mtn	HSB 234	NV101437188	ESMERALDA
Hasbrouck Mtn	HSB 235	NV101437189	ESMERALDA
Hasbrouck Mtn	HSB 236	NV101437190	ESMERALDA
Hasbrouck Mtn	HSB 237	NV101437191	ESMERALDA
Hasbrouck Mtn	HSB 238	NV101437192	ESMERALDA
Hasbrouck Mtn	HSB 24	NV101375589	ESMERALDA
Hasbrouck Mtn	HSB 25	NV101375590	ESMERALDA
Hasbrouck Mtn	HSB 26	NV101375591	ESMERALDA
Hasbrouck Mtn	HSB 27	NV101375592	ESMERALDA
Hasbrouck Mtn	HSB 273	NV101437193	ESMERALDA
Hasbrouck Mtn	HSB 274	NV101437194	ESMERALDA
Hasbrouck Mtn	HSB 28	NV101375593	ESMERALDA
Hasbrouck Mtn	HSB 29	NV101375594	ESMERALDA
Hasbrouck Mtn	HSB 3	NV101375568	ESMERALDA
Hasbrouck Mtn	HSB 30	NV101375595	ESMERALDA
Hasbrouck Mtn	HSB 309	NV101437195	ESMERALDA
Hasbrouck Mtn	HSB 31	NV101375596	ESMERALDA
Hasbrouck Mtn	HSB 313	NV101437196	ESMERALDA
Hasbrouck Mtn	HSB 315	NV101437197	ESMERALDA
Hasbrouck Mtn	HSB 317	NV101437198	ESMERALDA
Hasbrouck Mtn	HSB 319	NV101437199	ESMERALDA
Hasbrouck Mtn	HSB 32	NV101375597	ESMERALDA
Hasbrouck Mtn	HSB 321	NV101437200	ESMERALDA
Hasbrouck Mtn	HSB 323	NV101437917	ESMERALDA
Hasbrouck Mtn	HSB 325	NV101437918	ESMERALDA
Hasbrouck Mtn	HSB 327	NV101437919	ESMERALDA
Hasbrouck Mtn	HSB 329	NV101437920	ESMERALDA
Hasbrouck Mtn	HSB 33	NV101375598	ESMERALDA
Hasbrouck Mtn	HSB 331	NV101437921	ESMERALDA
Hasbrouck Mtn	HSB 333	NV101437922	ESMERALDA
Hasbrouck Mtn	HSB 335	NV101437923	ESMERALDA
Hasbrouck Mtn	HSB 337	NV101437924	ESMERALDA
Hasbrouck Mtn	HSB 339	NV101437925	ESMERALDA
Hasbrouck Mtn	HSB 34	NV101375599	ESMERALDA
Hasbrouck Mtn	HSB 341	NV101437926	ESMERALDA
Hasbrouck Mtn	HSB 342	NV101437927	ESMERALDA
Hasbrouck Mtn	HSB 343	NV101437928	ESMERALDA
Hasbrouck Mtn	HSB 344	NV101437929	ESMERALDA
Hasbrouck Mtn	HSB 345	NV101437930	ESMERALDA
Hasbrouck Mtn	HSB 346	NV101437931	ESMERALDA
Hasbrouck Mtn	HSB 347	NV101437932	ESMERALDA
Hasbrouck Mtn	HSB 348	NV101437933	ESMERALDA
Hasbrouck Mtn	HSB 349	NV101437934	ESMERALDA
Hasbrouck Mtn	HSB 35	NV101375600	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 350	NV101437935	ESMERALDA
Hasbrouck Mtn	HSB 351	NV101437936	ESMERALDA
Hasbrouck Mtn	HSB 352	NV101437937	ESMERALDA
Hasbrouck Mtn	HSB 353	NV101437938	ESMERALDA
Hasbrouck Mtn	HSB 354	NV101437939	ESMERALDA
Hasbrouck Mtn	HSB 355	NV101437940	ESMERALDA
Hasbrouck Mtn	HSB 356	NV101437941	ESMERALDA
Hasbrouck Mtn	HSB 357	NV101437942	ESMERALDA
Hasbrouck Mtn	HSB 358	NV101437943	ESMERALDA
Hasbrouck Mtn	HSB 359	NV101437944	ESMERALDA
Hasbrouck Mtn	HSB 36	NV101436391	ESMERALDA
Hasbrouck Mtn	HSB 360	NV101437945	ESMERALDA
Hasbrouck Mtn	HSB 361	NV101437946	ESMERALDA
Hasbrouck Mtn	HSB 362	NV101437947	ESMERALDA
Hasbrouck Mtn	HSB 363	NV101437948	ESMERALDA
Hasbrouck Mtn	HSB 364	NV101437949	ESMERALDA
Hasbrouck Mtn	HSB 365	NV101437950	ESMERALDA
Hasbrouck Mtn	HSB 366	NV101437951	ESMERALDA
Hasbrouck Mtn	HSB 367	NV101437952	ESMERALDA
Hasbrouck Mtn	HSB 368	NV101437953	ESMERALDA
Hasbrouck Mtn	HSB 369	NV101437954	ESMERALDA
Hasbrouck Mtn	HSB 37	NV101436392	ESMERALDA
Hasbrouck Mtn	HSB 370	NV101437955	ESMERALDA
Hasbrouck Mtn	HSB 371	NV101437956	ESMERALDA
Hasbrouck Mtn	HSB 372	NV101437957	ESMERALDA
Hasbrouck Mtn	HSB 373	NV101437958	ESMERALDA
Hasbrouck Mtn	HSB 374	NV101437959	ESMERALDA
Hasbrouck Mtn	HSB 375	NV101437960	ESMERALDA
Hasbrouck Mtn	HSB 376	NV101437961	ESMERALDA
Hasbrouck Mtn	HSB 377	NV101374760	ESMERALDA
Hasbrouck Mtn	HSB 378	NV101374761	ESMERALDA
Hasbrouck Mtn	HSB 379	NV101374762	ESMERALDA
Hasbrouck Mtn	HSB 38	NV101436393	ESMERALDA
Hasbrouck Mtn	HSB 380	NV101374763	ESMERALDA
Hasbrouck Mtn	HSB 381	NV101374764	ESMERALDA
Hasbrouck Mtn	HSB 382	NV101374765	ESMERALDA
Hasbrouck Mtn	HSB 383	NV101374766	ESMERALDA
Hasbrouck Mtn	HSB 384	NV101374767	ESMERALDA
Hasbrouck Mtn	HSB 385	NV101374768	ESMERALDA
Hasbrouck Mtn	HSB 386	NV101374769	ESMERALDA
Hasbrouck Mtn	HSB 387	NV101374770	ESMERALDA
Hasbrouck Mtn	HSB 388	NV101374771	ESMERALDA
Hasbrouck Mtn	HSB 389	NV101374772	ESMERALDA
Hasbrouck Mtn	HSB 39	NV101436394	ESMERALDA
Hasbrouck Mtn	HSB 390	NV101374773	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 391	NV101374774	ESMERALDA
Hasbrouck Mtn	HSB 392	NV101374775	ESMERALDA
Hasbrouck Mtn	HSB 393	NV101374776	ESMERALDA
Hasbrouck Mtn	HSB 394	NV101374777	ESMERALDA
Hasbrouck Mtn	HSB 395	NV101374778	ESMERALDA
Hasbrouck Mtn	HSB 396	NV101374779	ESMERALDA
Hasbrouck Mtn	HSB 397	NV101374780	ESMERALDA
Hasbrouck Mtn	HSB 398	NV101374781	ESMERALDA
Hasbrouck Mtn	HSB 399	NV101374782	ESMERALDA
Hasbrouck Mtn	HSB 4	NV101375569	ESMERALDA
Hasbrouck Mtn	HSB 40	NV101436395	ESMERALDA
Hasbrouck Mtn	HSB 400	NV101374783	ESMERALDA
Hasbrouck Mtn	HSB 401	NV101374784	ESMERALDA
Hasbrouck Mtn	HSB 402	NV101374785	ESMERALDA
Hasbrouck Mtn	HSB 403	NV101374786	ESMERALDA
Hasbrouck Mtn	HSB 404	NV101374787	ESMERALDA
Hasbrouck Mtn	HSB 405	NV101374788	ESMERALDA
Hasbrouck Mtn	HSB 406	NV101374789	ESMERALDA
Hasbrouck Mtn	HSB 407	NV101374790	ESMERALDA
Hasbrouck Mtn	HSB 408	NV101374791	ESMERALDA
Hasbrouck Mtn	HSB 409	NV101374792	ESMERALDA
Hasbrouck Mtn	HSB 41	NV101436396	ESMERALDA
Hasbrouck Mtn	HSB 410	NV101374793	ESMERALDA
Hasbrouck Mtn	HSB 411	NV101374794	ESMERALDA
Hasbrouck Mtn	HSB 412	NV101374795	ESMERALDA
Hasbrouck Mtn	HSB 413	NV101374796	ESMERALDA
Hasbrouck Mtn	HSB 414	NV101374797	ESMERALDA
Hasbrouck Mtn	HSB 415	NV101374798	ESMERALDA
Hasbrouck Mtn	HSB 416	NV101374799	ESMERALDA
Hasbrouck Mtn	HSB 417	NV101374800	ESMERALDA
Hasbrouck Mtn	HSB 418	NV101372180	ESMERALDA
Hasbrouck Mtn	HSB 419	NV101372181	ESMERALDA
Hasbrouck Mtn	HSB 42	NV101436397	ESMERALDA
Hasbrouck Mtn	HSB 420	NV101372182	ESMERALDA
Hasbrouck Mtn	HSB 421	NV101372183	ESMERALDA
Hasbrouck Mtn	HSB 422	NV101372184	ESMERALDA
Hasbrouck Mtn	HSB 423	NV101372185	ESMERALDA
Hasbrouck Mtn	HSB 424	NV101372186	ESMERALDA
Hasbrouck Mtn	HSB 427	NV101372187	ESMERALDA
Hasbrouck Mtn	HSB 428	NV101372188	ESMERALDA
Hasbrouck Mtn	HSB 43	NV101436398	ESMERALDA
Hasbrouck Mtn	HSB 44	NV101436399	ESMERALDA
Hasbrouck Mtn	HSB 45	NV101436400	ESMERALDA
Hasbrouck Mtn	HSB 46	NV101436548	ESMERALDA
Hasbrouck Mtn	HSB 47	NV101436549	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 48	NV101436550	ESMERALDA
Hasbrouck Mtn	HSB 49	NV101436551	ESMERALDA
Hasbrouck Mtn	HSB 5	NV101375570	ESMERALDA
Hasbrouck Mtn	HSB 50	NV101436552	ESMERALDA
Hasbrouck Mtn	HSB 51	NV101436553	ESMERALDA
Hasbrouck Mtn	HSB 52	NV101436554	ESMERALDA
Hasbrouck Mtn	HSB 53	NV101436555	ESMERALDA
Hasbrouck Mtn	HSB 54	NV101436556	ESMERALDA
Hasbrouck Mtn	HSB 55	NV101436557	ESMERALDA
Hasbrouck Mtn	HSB 56	NV101436558	ESMERALDA
Hasbrouck Mtn	HSB 57	NV101436559	ESMERALDA
Hasbrouck Mtn	HSB 58	NV101436560	ESMERALDA
Hasbrouck Mtn	HSB 59	NV101436561	ESMERALDA
Hasbrouck Mtn	HSB 6	NV101375571	ESMERALDA
Hasbrouck Mtn	HSB 60	NV101436562	ESMERALDA
Hasbrouck Mtn	HSB 61	NV101436563	ESMERALDA
Hasbrouck Mtn	HSB 62	NV101436564	ESMERALDA
Hasbrouck Mtn	HSB 63	NV101436565	ESMERALDA
Hasbrouck Mtn	HSB 64	NV101436566	ESMERALDA
Hasbrouck Mtn	HSB 65	NV101436567	ESMERALDA
Hasbrouck Mtn	HSB 66	NV101436568	ESMERALDA
Hasbrouck Mtn	HSB 67	NV101436569	ESMERALDA
Hasbrouck Mtn	HSB 68	NV101436570	ESMERALDA
Hasbrouck Mtn	HSB 69	NV101436571	ESMERALDA
Hasbrouck Mtn	HSB 7	NV101375572	ESMERALDA
Hasbrouck Mtn	HSB 70	NV101436572	ESMERALDA
Hasbrouck Mtn	HSB 71	NV101436573	ESMERALDA
Hasbrouck Mtn	HSB 72	NV101436574	ESMERALDA
Hasbrouck Mtn	HSB 73	NV101436575	ESMERALDA
Hasbrouck Mtn	HSB 74	NV101436576	ESMERALDA
Hasbrouck Mtn	HSB 75	NV101436577	ESMERALDA
Hasbrouck Mtn	HSB 76	NV101436578	ESMERALDA
Hasbrouck Mtn	HSB 77	NV101436579	ESMERALDA
Hasbrouck Mtn	HSB 78	NV101376180	ESMERALDA
Hasbrouck Mtn	HSB 79	NV101376181	ESMERALDA
Hasbrouck Mtn	HSB 8	NV101375573	ESMERALDA
Hasbrouck Mtn	HSB 80	NV101376182	ESMERALDA
Hasbrouck Mtn	HSB 81	NV101376183	ESMERALDA
Hasbrouck Mtn	HSB 82	NV101376184	ESMERALDA
Hasbrouck Mtn	HSB 83	NV101376185	ESMERALDA
Hasbrouck Mtn	HSB 84	NV101376186	ESMERALDA
Hasbrouck Mtn	HSB 85	NV101376187	ESMERALDA
Hasbrouck Mtn	HSB 86	NV101376188	ESMERALDA
Hasbrouck Mtn	HSB 87	NV101376189	ESMERALDA
Hasbrouck Mtn	HSB 88	NV101376190	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	HSB 89	NV101376191	ESMERALDA
Hasbrouck Mtn	HSB 9	NV101375574	ESMERALDA
Hasbrouck Mtn	HSB 90	NV101376192	ESMERALDA
Hasbrouck Mtn	HSB 91	NV101376193	ESMERALDA
Hasbrouck Mtn	HSB 92	NV101376194	ESMERALDA
Hasbrouck Mtn	HSB 93	NV101376195	ESMERALDA
Hasbrouck Mtn	HSB 94	NV101376196	ESMERALDA
Hasbrouck Mtn	HSB 95	NV101376197	ESMERALDA
Hasbrouck Mtn	HSB 96	NV101376198	ESMERALDA
Hasbrouck Mtn	HSB 97	NV101376199	ESMERALDA
Hasbrouck Mtn	HSB 98	NV101376200	ESMERALDA
Hasbrouck Mtn	HSB 99	NV101436580	ESMERALDA
Hasbrouck Mtn	ISRAELI	NV101564516	ESMERALDA
Hasbrouck Mtn	MLTD1R	NV101488519	ESMERALDA
Hasbrouck Mtn	MLTDR	NV101488520	ESMERALDA
Hasbrouck Mtn	NEW LITTLE BUTTE	NV101452981	ESMERALDA
Hasbrouck Mtn	NEW LTL BUTTE FRAC	NV101347946	ESMERALDA
Hasbrouck Mtn	NHD # 1	NV101409220	ESMERALDA
Hasbrouck Mtn	NHD # 10	NV101455194	ESMERALDA
Hasbrouck Mtn	NHD # 18	NV101521671	ESMERALDA
Hasbrouck Mtn	NHD # 3	NV101405455	ESMERALDA
Hasbrouck Mtn	NHD # 5	NV101403221	ESMERALDA
Hasbrouck Mtn	NHD # 6	NV101756941	ESMERALDA
Hasbrouck Mtn	NHD # 8	NV101344258	ESMERALDA
Hasbrouck Mtn	NHD #167J	NV101340629	ESMERALDA
Hasbrouck Mtn	NHD #173	NV101751265	ESMERALDA
Hasbrouck Mtn	NHD #174	NV101459613	ESMERALDA
Hasbrouck Mtn	NHD #175	NV101731137	ESMERALDA
Hasbrouck Mtn	NHD #176	NV101495816	ESMERALDA
Hasbrouck Mtn	NHD #178	NV101499853	ESMERALDA
Hasbrouck Mtn	NHD #179	NV101459866	ESMERALDA
Hasbrouck Mtn	NHD #190	NV101402611	ESMERALDA
Hasbrouck Mtn	NHD #191	NV101505694	ESMERALDA
Hasbrouck Mtn	NHD #192	NV101407044	ESMERALDA
Hasbrouck Mtn	NHD #193	NV101508217	ESMERALDA
Hasbrouck Mtn	NHD #194	NV101403874	ESMERALDA
Hasbrouck Mtn	NHD #195	NV101497767	ESMERALDA
Hasbrouck Mtn	NHD #196	NV101403888	ESMERALDA
Hasbrouck Mtn	NHD #197	NV101456095	ESMERALDA
Hasbrouck Mtn	NHD #198	NV101523217	ESMERALDA
Hasbrouck Mtn	NHD #199	NV101457315	ESMERALDA
Hasbrouck Mtn	NHD #200	NV101523845	ESMERALDA
Hasbrouck Mtn	NHD #203	NV101453901	ESMERALDA
Hasbrouck Mtn	NHD #204	NV101527118	ESMERALDA
Hasbrouck Mtn	NHD #206	NV101523487	ESMERALDA

Area	Claim Name	Serial Number	County
Hasbrouck Mtn	NHD #207	NV101543551	ESMERALDA
Hasbrouck Mtn	NHD #212	NV101525250	ESMERALDA
Hasbrouck Mtn	NHD 12	NV101872628	ESMERALDA
Hasbrouck Mtn	NHD 132	NV101873469	ESMERALDA
Hasbrouck Mtn	NHD 154M	NV101606003	ESMERALDA
Hasbrouck Mtn	NHD 155M	NV101509451	ESMERALDA
Hasbrouck Mtn	NHD 156M	NV101605433	ESMERALDA
Hasbrouck Mtn	NHD 157M	NV101502060	ESMERALDA
Hasbrouck Mtn	NHD 158M	NV101731403	ESMERALDA
Hasbrouck Mtn	NHD 159M	NV101504587	ESMERALDA
Hasbrouck Mtn	NHD 169M	NV101301094	ESMERALDA
Hasbrouck Mtn	NHD 171M	NV101454361	ESMERALDA
Hasbrouck Mtn	NHD 186M	NV101347416	ESMERALDA
Hasbrouck Mtn	NHD 187M	NV101457561	ESMERALDA
Hasbrouck Mtn	NHD 188M	NV101544776	ESMERALDA
Hasbrouck Mtn	NHD 189M	NV101605940	ESMERALDA
Hasbrouck Mtn	NHD 28	NV101872629	ESMERALDA
Hasbrouck Mtn	NHD-7	NV101479533	ESMERALDA
Hasbrouck Mtn	TP 1	NV101658402	ESMERALDA
Hasbrouck Mtn	TP 2	NV101880712	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 1	NV101789097	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 10	NV101790272	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 11	NV101790273	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 12	NV101790274	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 13	NV101790275	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 14	NV101790276	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 15	NV101790277	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 16	NV101790278	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 17	NV101790279	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 18	NV101790280	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 19	NV101790281	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 2	NV101789098	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 20	NV101790282	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 21	NV101790283	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 22	NV101790284	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 3	NV101789099	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 4	NV101789100	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 5	NV101789101	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 6	NV101789102	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 7	NV101789103	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 8	NV101789104	ESMERALDA
Hasbrouck Mtn	WHOG LODE CLAIM 9	NV101789105	ESMERALDA
Hill of Gold	HILL OF GOLD # 1	NV101548815	ESMERALDA
Hill of Gold	HILL OF GOLD # 2	NV101347530	ESMERALDA
Hill of Gold	HILL OF GOLD # 3	NV101479456	ESMERALDA

Area	Claim Name	Serial Number	County
Hill of Gold	HILL OF GOLD # 4	NV101304543	ESMERALDA
Hill of Gold	HILL OF GOLD # 5	NV101457348	ESMERALDA
Hill of Gold	HILL OF GOLD 10	NV101659471	ESMERALDA
Hill of Gold	HILL OF GOLD 11	NV101659472	ESMERALDA
Hill of Gold	HILL OF GOLD 12	NV101659473	ESMERALDA
Hill of Gold	HILL OF GOLD 13	NV101659474	ESMERALDA
Hill of Gold	HILL OF GOLD 14	NV101659475	ESMERALDA
Hill of Gold	HILL OF GOLD 15	NV101659476	ESMERALDA
Hill of Gold	HILL OF GOLD 16	NV101659477	ESMERALDA
Hill of Gold	HILL OF GOLD 17	NV101659478	ESMERALDA
Hill of Gold	HILL OF GOLD 18	NV101659479	ESMERALDA
Hill of Gold	HILL OF GOLD 19	NV101659480	ESMERALDA
Hill of Gold	HILL OF GOLD 20	NV101659481	ESMERALDA
Hill of Gold	HILL OF GOLD 21	NV101660156	ESMERALDA
Hill of Gold	HILL OF GOLD 22	NV101660157	ESMERALDA
Hill of Gold	HILL OF GOLD 23	NV101660158	ESMERALDA
Hill of Gold	HILL OF GOLD 24	NV101660159	ESMERALDA
Hill of Gold	HILL OF GOLD 25	NV101660160	ESMERALDA
Hill of Gold	HILL OF GOLD 26	NV101660161	ESMERALDA
Hill of Gold	HILL OF GOLD 27	NV101660162	ESMERALDA
Hill of Gold	HILL OF GOLD 28	NV101660163	ESMERALDA
Hill of Gold	HILL OF GOLD 29	NV101660164	ESMERALDA
Three Hills	ABA # 15	NV101509290	ESMERALDA
Three Hills	ABA # 16	NV101301150	ESMERALDA
Three Hills	ABA # 17	NV101491409	ESMERALDA
Three Hills	ABA # 18	NV101603968	ESMERALDA
Three Hills	ABA # 19	NV101506806	ESMERALDA
Three Hills	ABA # 24	NV101349228	ESMERALDA
Three Hills	ABA # 25	NV101526244	ESMERALDA
Three Hills	ABA # 26	NV101477462	ESMERALDA
Three Hills	TH 1	NV101545140	ESMERALDA
Three Hills	TH 10	NV101546453	ESMERALDA & NYE
Three Hills	TH 11	NV101546454	ESMERALDA
Three Hills	TH 12	NV101546455	ESMERALDA
Three Hills	TH 13	NV101546456	ESMERALDA
Three Hills	TH 14	NV101546457	ESMERALDA
Three Hills	TH 15	NV101546458	ESMERALDA
Three Hills	TH 16	NV101546459	ESMERALDA
Three Hills	TH 17	NV101546460	ESMERALDA
Three Hills	TH 18	NV101546461	ESMERALDA
Three Hills	TH 19	NV101546462	ESMERALDA
Three Hills	TH 2	NV101545141	ESMERALDA & NYE
Three Hills	TH 20	NV101546463	ESMERALDA
Three Hills	TH 21	NV101546464	ESMERALDA
Three Hills	TH 22	NV101546465	ESMERALDA

Area	Claim Name	Serial Number	County
Three Hills	TH 23	NV101546466	ESMERALDA
Three Hills	TH 24	NV101546467	ESMERALDA
Three Hills	TH 25	NV101546468	ESMERALDA
Three Hills	TH 26	NV101546469	ESMERALDA
Three Hills	TH 27	NV101546470	ESMERALDA
Three Hills	TH 28	NV101546471	ESMERALDA
Three Hills	TH 29	NV101546472	ESMERALDA
Three Hills	TH 3	NV101545142	ESMERALDA
Three Hills	TH 30	NV101547773	ESMERALDA
Three Hills	TH 31	NV101547774	ESMERALDA
Three Hills	TH 32	NV101547775	ESMERALDA
Three Hills	TH 33	NV101547776	ESMERALDA
Three Hills	TH 34	NV101547777	ESMERALDA
Three Hills	TH 35	NV101547778	ESMERALDA
Three Hills	TH 36	NV101547779	ESMERALDA
Three Hills	TH 37	NV101547780	ESMERALDA
Three Hills	TH 38	NV101547781	ESMERALDA
Three Hills	TH 39	NV101547782	ESMERALDA
Three Hills	TH 4	NV101545143	ESMERALDA & NYE
Three Hills	TH 40	NV101547783	ESMERALDA
Three Hills	TH 41	NV101547784	ESMERALDA
Three Hills	TH 42	NV101547785	ESMERALDA
Three Hills	TH 43	NV101547786	ESMERALDA
Three Hills	TH 44	NV101547787	ESMERALDA
Three Hills	TH 45	NV101547788	ESMERALDA
Three Hills	TH 46	NV101547789	ESMERALDA
Three Hills	TH 47	NV101547790	ESMERALDA
Three Hills	TH 48	NV101547791	ESMERALDA
Three Hills	TH 49	NV101547792	ESMERALDA
Three Hills	TH 5	NV101545144	ESMERALDA
Three Hills	TH 50	NV101547793	ESMERALDA
Three Hills	TH 51	NV101549100	ESMERALDA
Three Hills	TH 52	NV101549101	ESMERALDA
Three Hills	TH 53	NV101549102	ESMERALDA
Three Hills	TH 54	NV101549103	ESMERALDA
Three Hills	TH 55	NV101549104	ESMERALDA
Three Hills	TH 56	NV101549105	ESMERALDA
Three Hills	TH 57	NV101549106	ESMERALDA
Three Hills	TH 58	NV101549107	ESMERALDA
Three Hills	TH 59	NV101549108	ESMERALDA
Three Hills	TH 6	NV101545145	ESMERALDA & NYE
Three Hills	TH 60	NV101549109	ESMERALDA
Three Hills	TH 61	NV101549110	ESMERALDA
Three Hills	TH 61A	NV101377000	ESMERALDA
Three Hills	TH 62	NV101377002	ESMERALDA

Area	Claim Name	Serial Number	County
Three Hills	TH 63	NV101377003	ESMERALDA
Three Hills	TH 64	NV101377004	ESMERALDA
Three Hills	TH 65	NV101377005	ESMERALDA
Three Hills	TH 66	NV101377006	ESMERALDA
Three Hills	TH 67	NV101377007	ESMERALDA
Three Hills	TH 68	NV101377008	ESMERALDA
Three Hills	TH 69	NV101377009	ESMERALDA
Three Hills	TH 7	NV101545146	ESMERALDA
Three Hills	TH 70	NV101377010	ESMERALDA
Three Hills	TH 71	NV101377924	ESMERALDA
Three Hills	TH 72	NV101377925	ESMERALDA
Three Hills	TH 73	NV101377926	ESMERALDA
Three Hills	TH 74	NV101377927	ESMERALDA
Three Hills	TH 75	NV101377928	ESMERALDA
Three Hills	TH 76	NV101377929	ESMERALDA
Three Hills	TH 77	NV101377930	ESMERALDA
Three Hills	TH 78	NV101377931	ESMERALDA
Three Hills	TH 79	NV101377932	ESMERALDA
Three Hills	TH 8	NV101545147	ESMERALDA & NYE
Three Hills	TH 80	NV101377933	ESMERALDA
Three Hills	TH 81	NV101377934	ESMERALDA
Three Hills	TH 82	NV101377935	ESMERALDA
Three Hills	TH 83	NV101377936	ESMERALDA
Three Hills	TH 84	NV101377937	ESMERALDA
Three Hills	TH 9	NV101546452	ESMERALDA
Three Hills	THREE HILLS # 1	NV101526943	ESMERALDA
Three Hills	THREE HILLS # 2	NV101457411	ESMERALDA
Three Hills	THREE HILLS # 3	NV102521541	ESMERALDA
Three Hills	THREE HILLS # 4	NV101495248	ESMERALDA
Three Hills	THREE HILLS # 5	NV101480173	ESMERALDA
Three Hills	THREE HILLS # 6	NV101496503	ESMERALDA
Three Hills	THREE HILLS # 7	NV101520432	ESMERALDA

A.2. LIST OF HASBROUCK PROJECT PATENTED CLAIMS

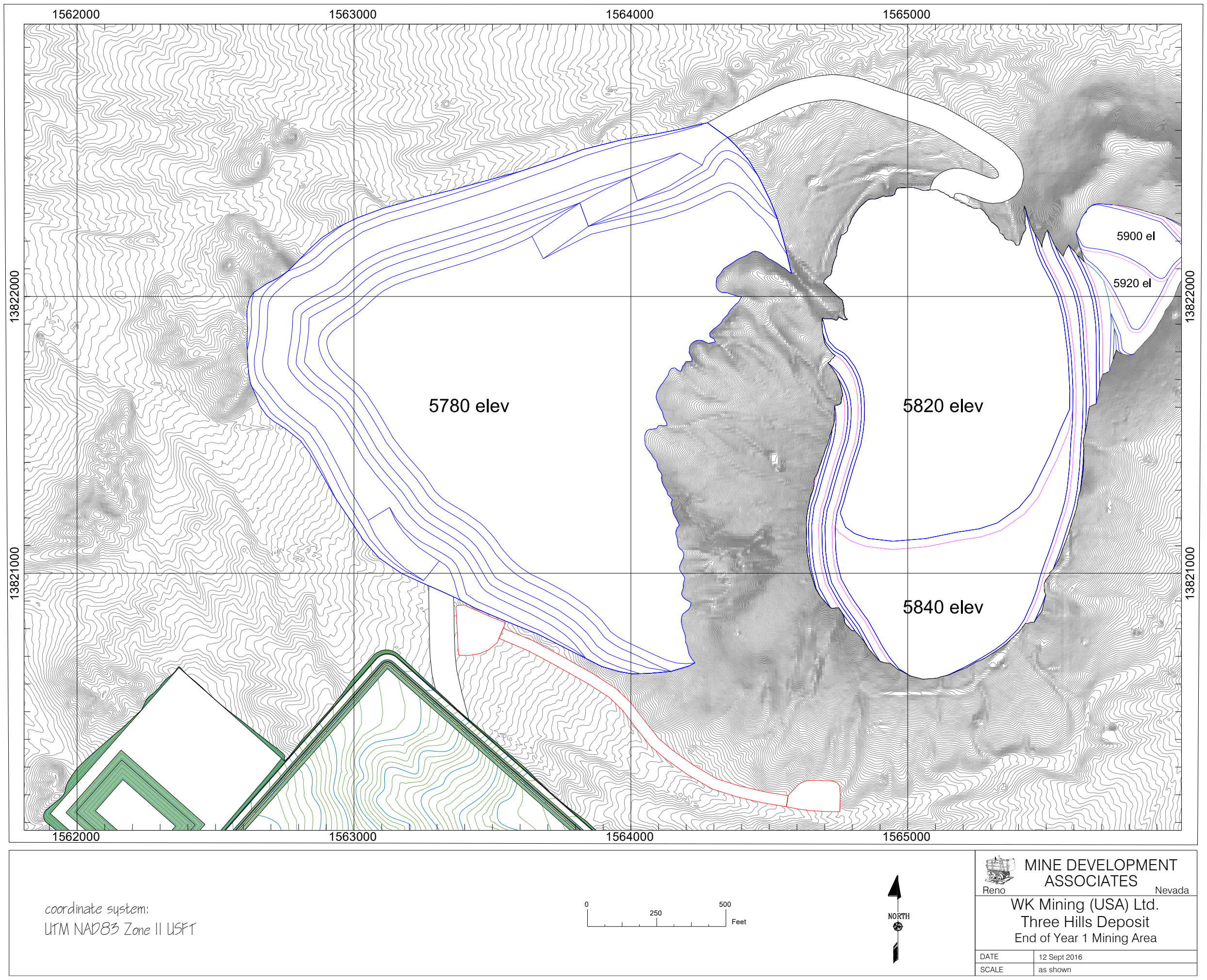
AREA	CLAIM NAME	PATENT NO.	MS#	APN#	COUNTY
Hasbrouck Mtn	Desert King	443624	4143	000-005-83	Esmeralda
Hasbrouck Mtn	Eliza Jane	443624	4143	000-005-83	Esmeralda
Hasbrouck Mtn	Last Chance	828482	4416	000-005-83	Esmeralda
Hasbrouck Mtn	Last Chance No. 1	828482	4416	000-005-83	Esmeralda
Hasbrouck Mtn	Last Chance No. 2	828482	4416	000-005-83	Esmeralda
Hasbrouck Mtn	Last Chance No. 3	828482	4416	000-005-83	Esmeralda
Hasbrouck Mtn	Lode	703972	4337	000-005-83	Esmeralda
Hasbrouck Mtn	Nonpareil No. 1	899381	4385	000-005-83	Esmeralda
Hasbrouck Mtn	Nonpareil No. 10	857951	4437	000-003-38	Esmeralda
Hasbrouck Mtn	Nonpareil No. 11	857951	4437	000-003-38	Esmeralda
Hasbrouck Mtn	Nonpareil No. 2	899381	4385	000-005-83	Esmeralda
Hasbrouck Mtn	Nonpareil No. 3	809601	4436	000-005-83	Esmeralda
Hasbrouck Mtn	Nonpareil No. 4	809601	4436	000-005-83	Esmeralda
Hasbrouck Mtn	Nonpareil No. 5	857954	4437	000-005-83	Esmeralda
Hasbrouck Mtn	Nonpareil No. 6	857954	4437	000-000-50	Esmeralda
Hasbrouck Mtn	Nonpareil No. 7	857954	4437	000-000-50	Esmeralda
Hasbrouck Mtn	Nonpareil No. 8	857954	4437	000-000-50	Esmeralda
Hasbrouck Mtn	Nonpareil No. 9	857951	4437	000-003-38	Esmeralda
Hasbrouck Mtn	Polo	443624	4143	000-005-83	Esmeralda
Hasbrouck Mtn	Royal	818585	4386	000-005-83	Esmeralda
Hasbrouck Mtn	San Jose	703972	4337	000-005-83	Esmeralda
Hasbrouck Mtn	Sierra Nevada	703972	4337	000-005-83	Esmeralda
Hasbrouck Mtn	Silver King	891082	4387	000-002-89	Esmeralda
Hasbrouck Mtn	Silver King No.1	891082	4387	000-002-89	Esmeralda

AREA	CLAIM NAME	PATENT NO.	MS#	APN#	COUNTY
Hasbrouck Mtn	Star of the East	443624	4143	000-005-83	Esmeralda
Hasbrouck Mtn	T.F.G. NO. 1	819102	4428	000-002-85	Esmeralda
Hasbrouck Mtn	T.F.G. NO. 2	819102	4428	000-002-85	Esmeralda
Hasbrouck Mtn	TFG (90% fractional interest)	819102	4428	000-002-85	Esmeralda
Three Hills	Great Western	848685	4463	000-007-07	Esmeralda
Three Hills	Jupiter	277076	3898	000-006-98	Esmeralda
Three Hills	Mars	277076	277076	000-007-07	Esmeralda
Three Hills	Moon	277076	277076	000-007-07	Esmeralda
Three Hills	Rex	654427; 848685	4463	000-007-07	Esmeralda
Three Hills	Ruby	848685	4463	000-007-07	Esmeralda
Three Hills	Ruby 2	848685	4463	000-007-07	Esmeralda
Three Hills	Ruby 6	848685	4463	000-001-81	Esmeralda
Three Hills	Ruby No. 3	848685	4463	000-001-02	Esmeralda
Three Hills	Ruby No. 4	848685	4463	000-000-37	Esmeralda
Three Hills	Ruby No. 5	848685	4463	000-000-58	Esmeralda
Three Hills	Saturn	277076	3898	000-003-17	Esmeralda
Three Hills	Uranus	277076	3898	000-005-86	Esmeralda
Three Hills	Venus	277076	277076	000-007-07	Esmeralda

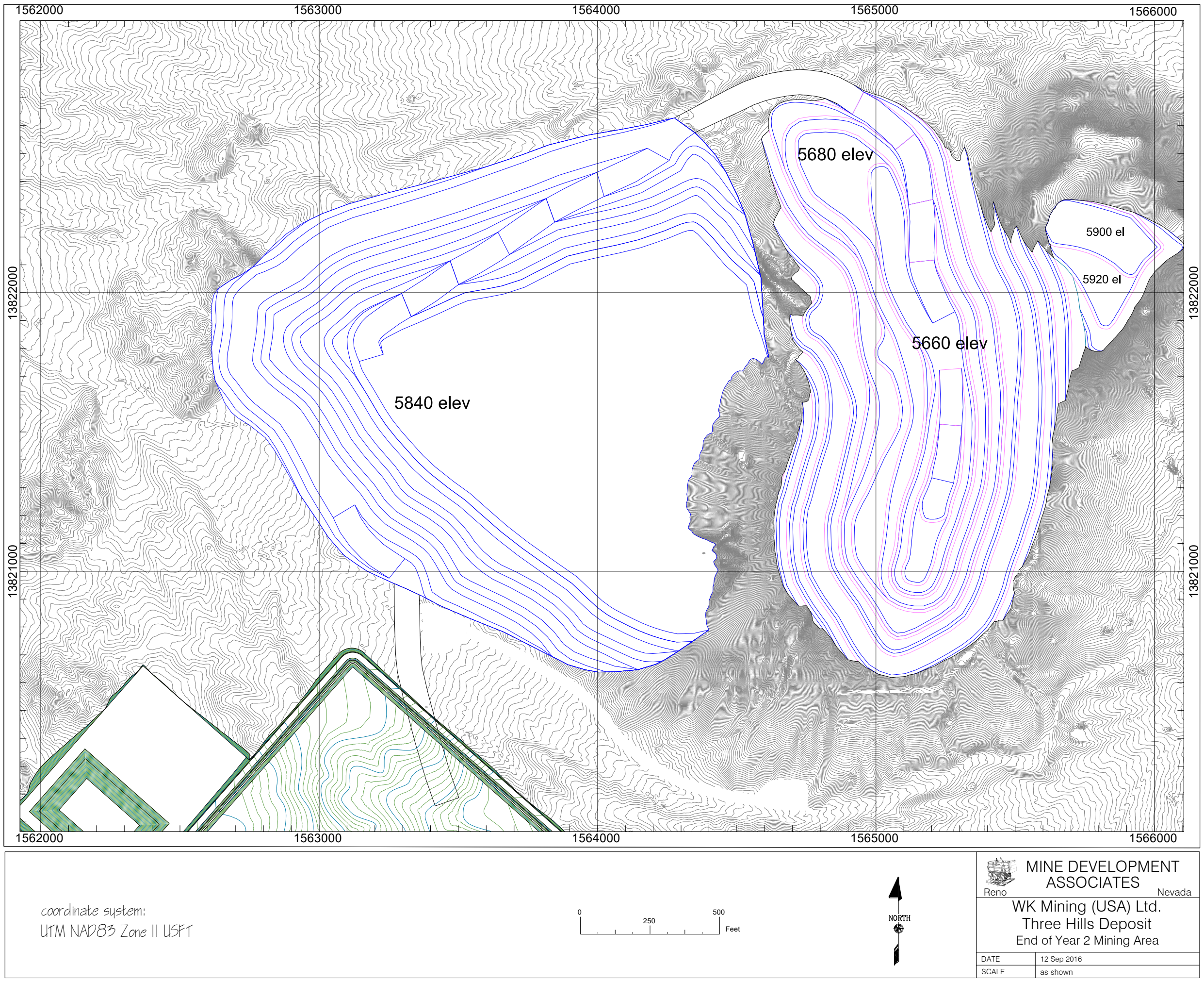
APPENDIX B

THREE HILLS MINE END OF YEAR PITS AND DUMPS

Three Hills Mine: End of Year 1



Three Hills Mine: End of Year 2

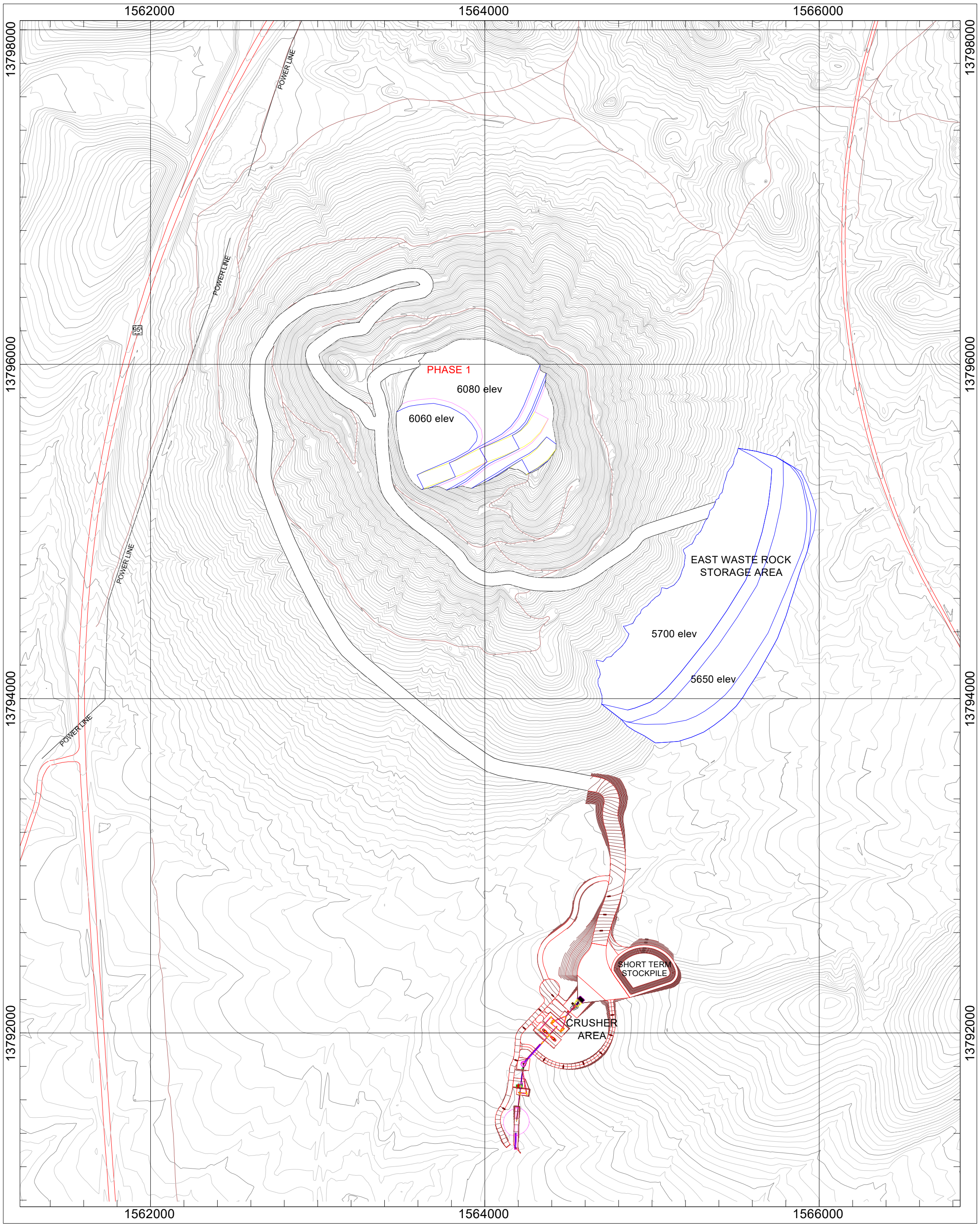


APPENDIX C

HASBROUCK MINE END OF YEAR PITS AND DUMPS

RESPEC

Hasbrouck Mine: End of Year 2



coordinate system:
UTM NAD83 Zone 11 USFT

0 500 1000 Feet

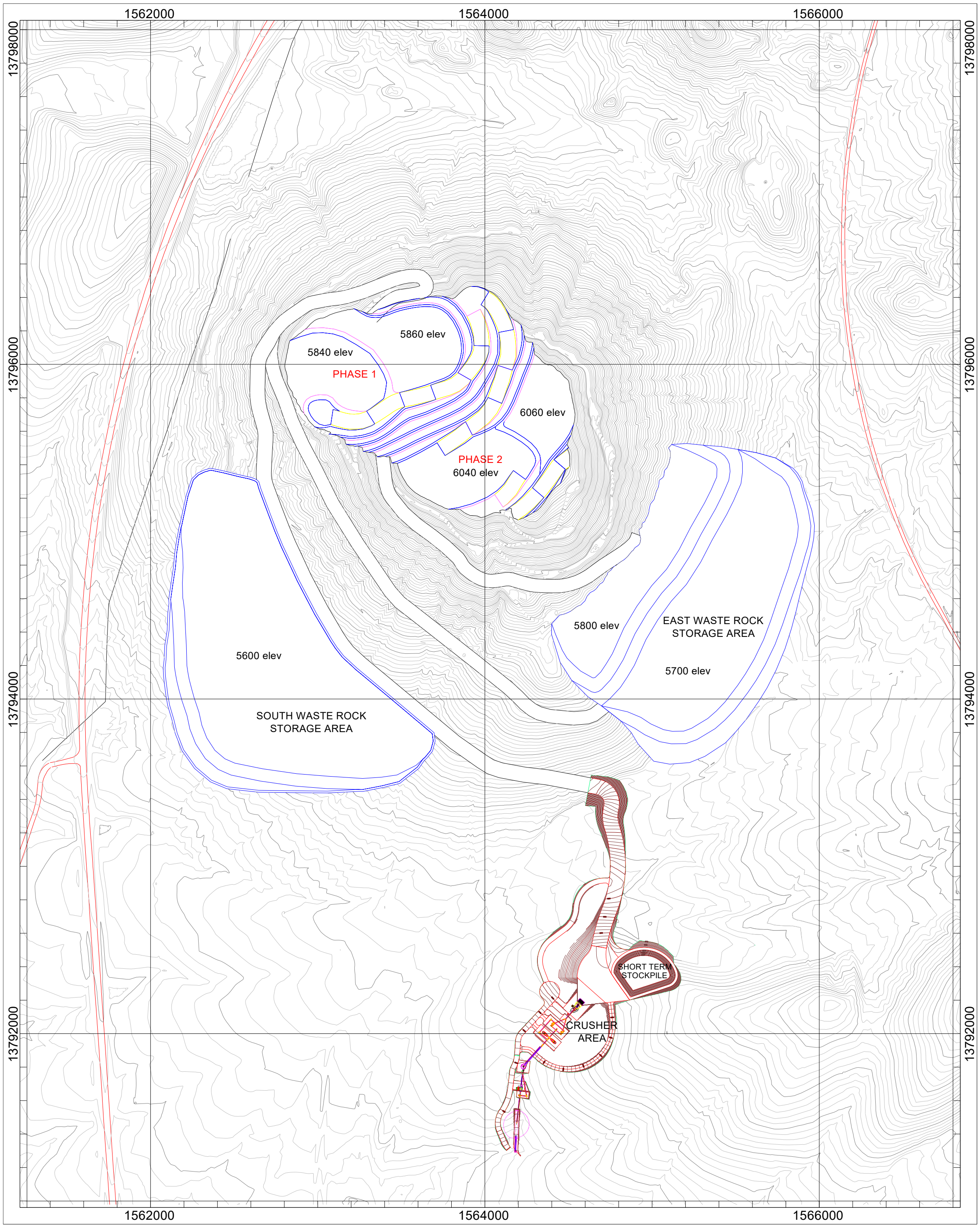
MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 2 Mining Area

DATE	29 Apr 2015
SCALE	as shown

RESPEC

Hasbrouck Mine: End of Year 3



coordinate system:
UTM NAD83 Zone 11 USFT

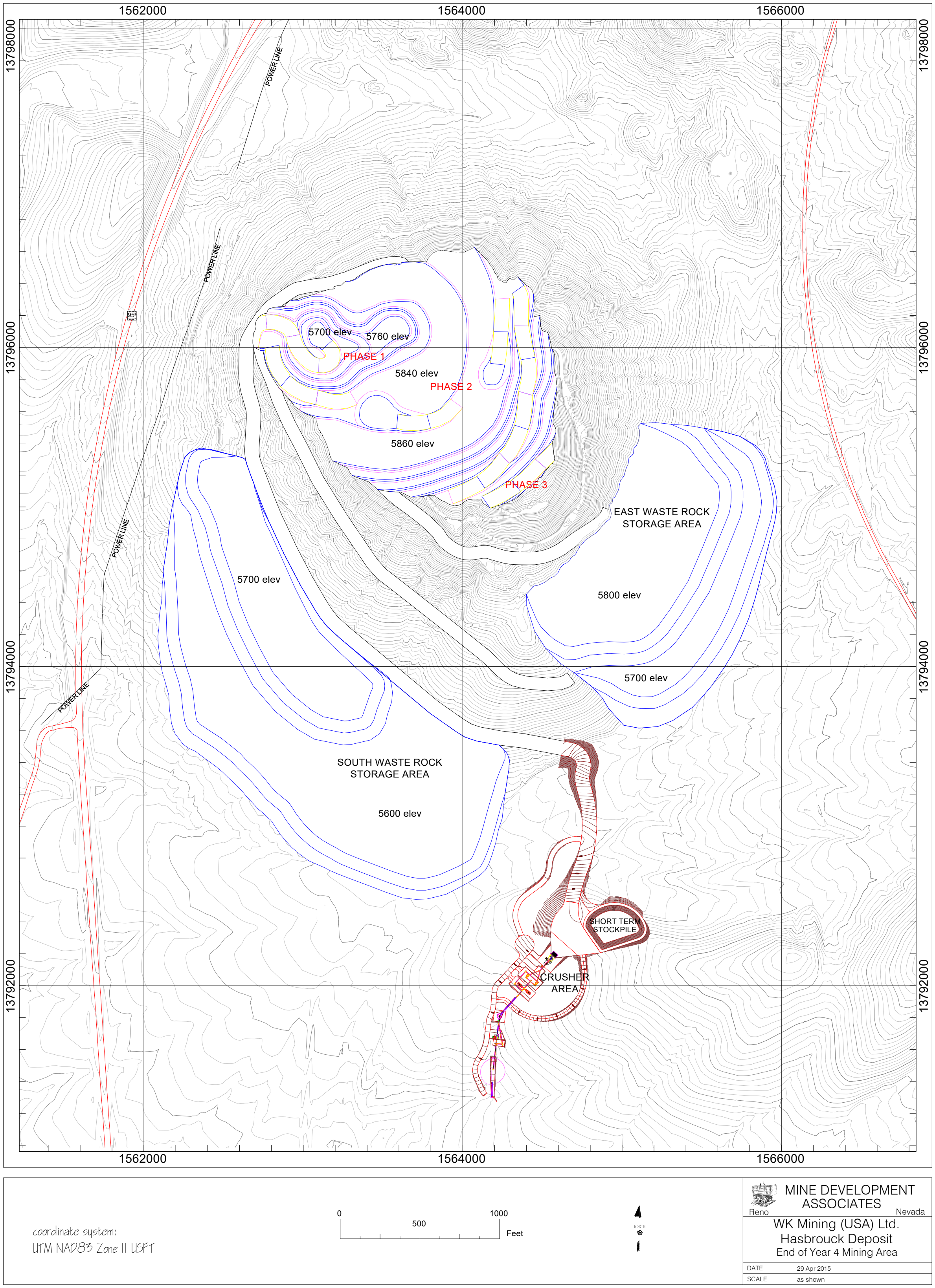
0 500 1000 Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 3 Mining Area

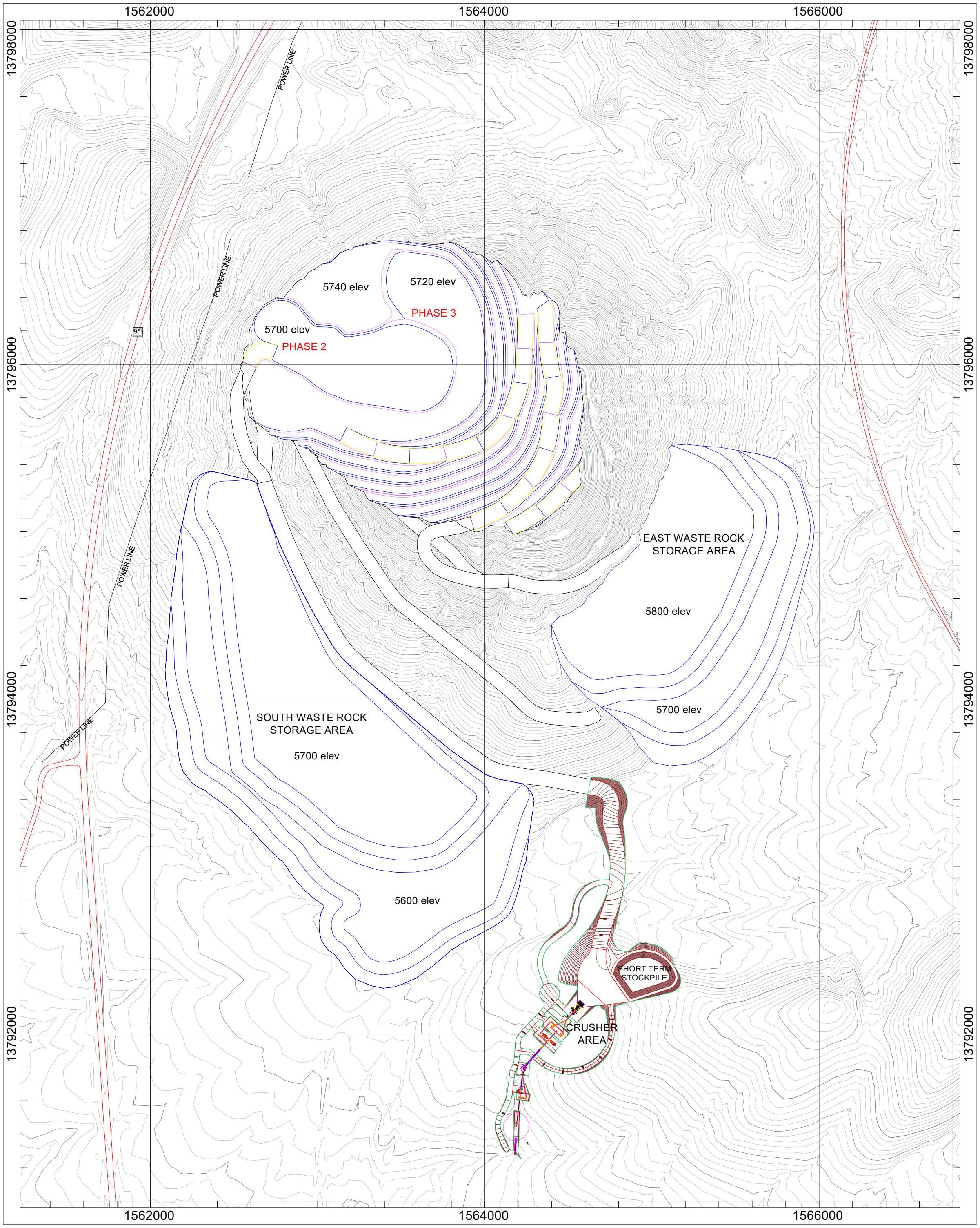
DATE	17 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 4



RESPEC

Hasbrouck Mine: End of Year 5



coordinate system:
UTM NAD83 Zone 11 USFT

0 500 1000 Feet

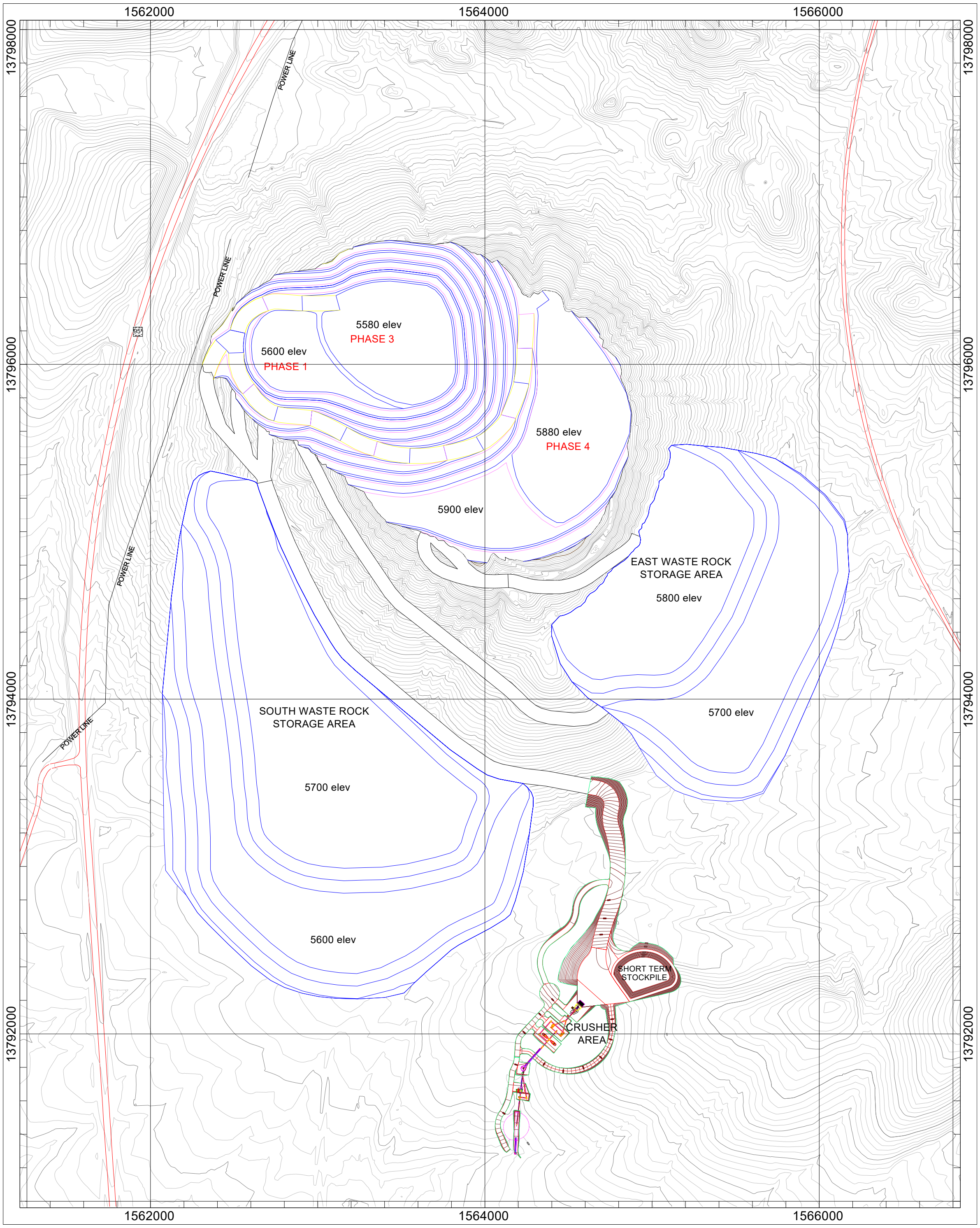
MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 5 Mining Area

DATE	24 Apr 2015
SCALE	as shown

RESPEC

Hasbrouck Mine: End of Year 6



coordinate system:
UTM NAD83 Zone 11 USFT

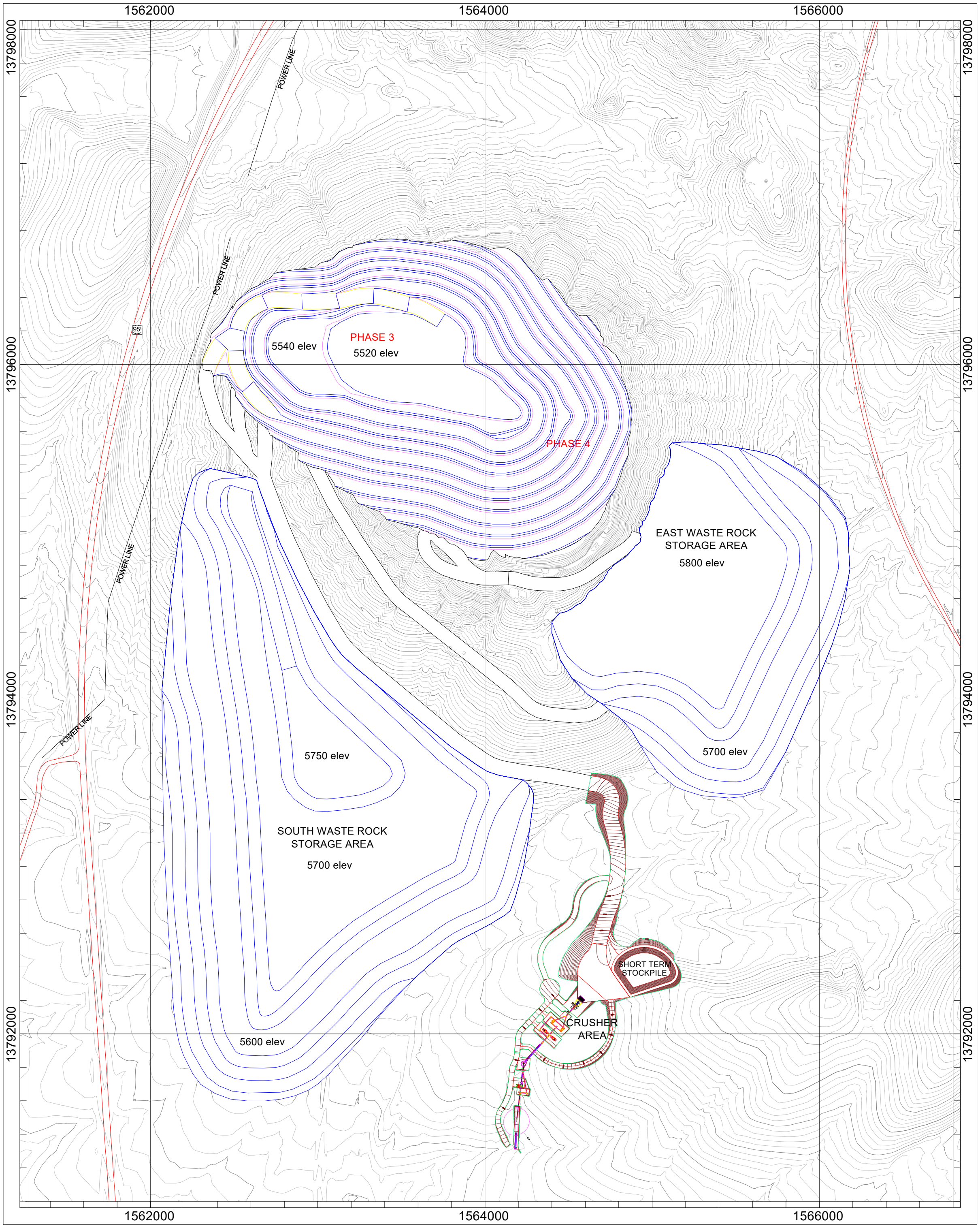
0 500 1000 Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

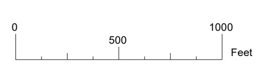
WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 6 Mining Area

DATE	24 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 7



coordinate system:
UTM NAD83 Zone 11 USFT

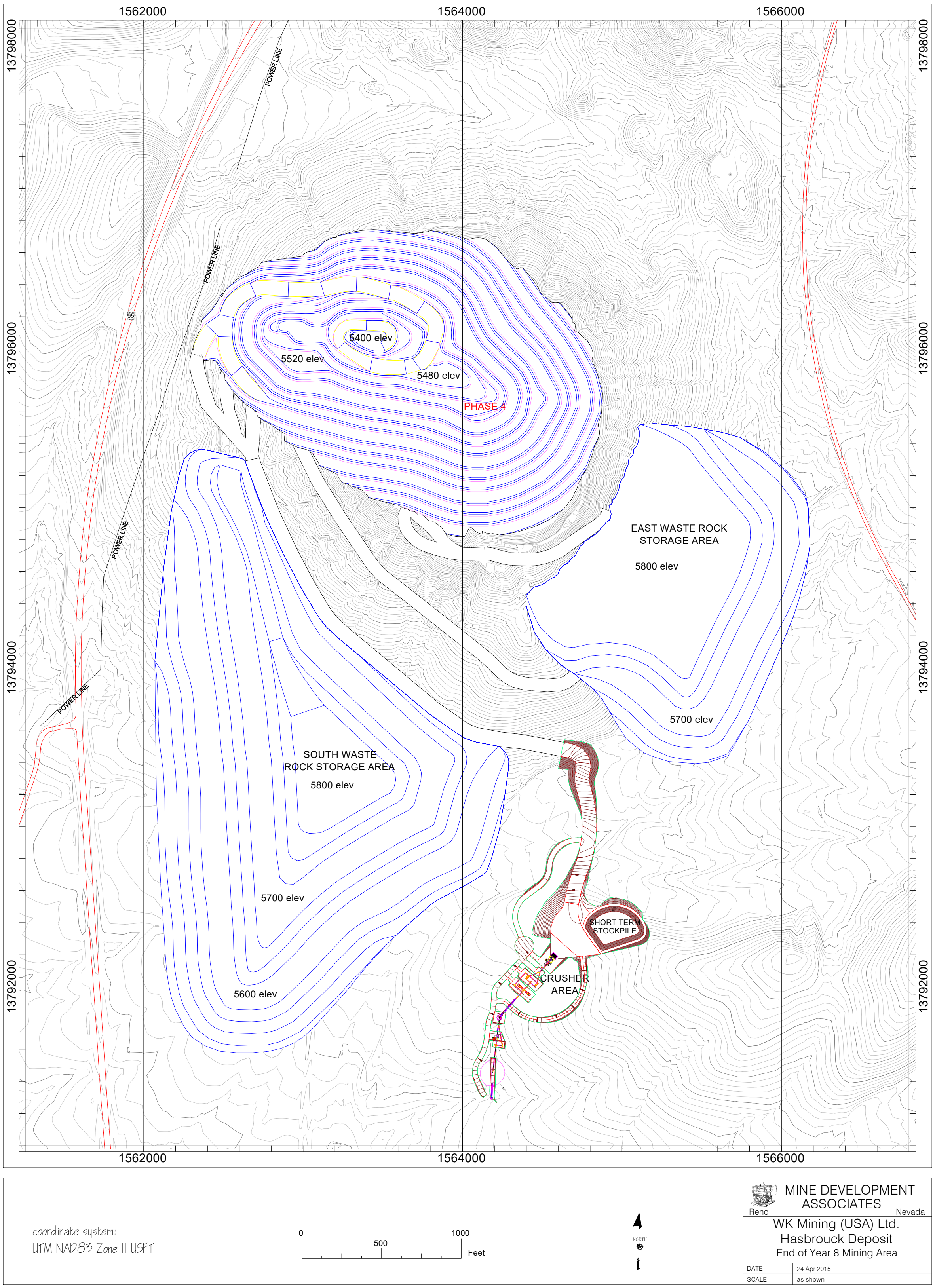


MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 7 Mining Area

DATE	24 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 8



APPENDIX D
METALLURGICAL RESULTS

D.1. THREE HILLS – COLUMN-LEACH TEST RESULTS

Drain-down volume and retained moisture were measured upon the completion of leaching.

Three Hills ROM Column Testing Drain Down
(Data from KCA, 2015)

KCA Test No.	Description	Sample Weight (kg)	Gallons Solution released/ton$_{dry\ ore}$	
71015	Bulk Material	11,991	24 hour	0.57
			48 hour	0.78
			72 hour	1.08
			96 hour	1.33
			120 hour	1.54
			144 hour	1.61
			168 hour	1.82

Three Hills ROM Column Testing Retained Moisture
(data from KCA, 2015)

KCA Test No.	Description	Days Leached	Retained Solution, gal/ton$_{dryore}$
71015	Bulk Material	133	39.6

Tests predict the final drain-down moisture of the ROM material to be 14%.

D.2. HASBROUCK MINE – COLUMN-LEACH TEST RESULTS

Allied Nevada commissioned 70 column tests performed by McClelland in 2012. Columns were loaded with composite samples from nine core holes representing the ore, sized at P80 3/4in and P80 3/8in sizes.

Hasbrouck Mine Gold Recovery in Column Tests
(data from McClelland, 2012)

Job Number	Column Number	% Au Recovery		% Ag Recovery	
		-3/4"	-3/8"	-3/4"	-3/8"
3536	0	42.9	36.8	13.3	16.7
3536	1	38.1	52.4	8.0	12.0
3536	2	61.5	66.7	12.0	16.7
3536	3	64.7	72.2	3.7	7.4
3536	4	71.4	78.6	4.3	9.1
3536	5	36.4	45.5	19.2	18.8
3536	6	56.3	69.2	4.8	6.7
3536	7	67.9	66.7	7.1	12.5
3536	8	69.2	66.7	14.3	11.1
3536	9	84.6	80.0	10.5	8.2
3536	10	75.0	79.2	5.1	6.4
3536	11	55.9	66.7	5.0	6.6
3536	12	50.0	50.0	13.6	16.7
3536	13	64.7	75.0	6.8	10.9
3536	14	64.3	62.5	5.3	10.5
3536	15	40.0	26.7	16.3	23.1
3536	16	41.7	44.4	9.1	14.3
3536	17A	58.1	67.6	20.0	23.8
3536	17B	58.6	72.4	14.0	28.9
3536	18	85.7	90.0	8.3	15.7
3536 Average		***61.3***	***65.4***	***10.0***	***13.8***
3465	1	33.3	38.1	18.6	22.4
3465	2	50.0	61.1	13.9	23.9
3465	3	60.0	66.7	12.9	18.3
3465	4	73.0	65.3	8.3	12.7
3465	5	75.0	83.3	2.6	3.5
3465	6	23.1	28.6	6.9	12.1
3465	7	31.6	36.4	7.7	14.8
3465	8	36.4	45.0	14.9	23.4
3465	9	50.0	50.0	10.2	15.2
3465	10	73.0	70.3	16.2	20.0
3465	11	45.0	52.6	4.3	7.6

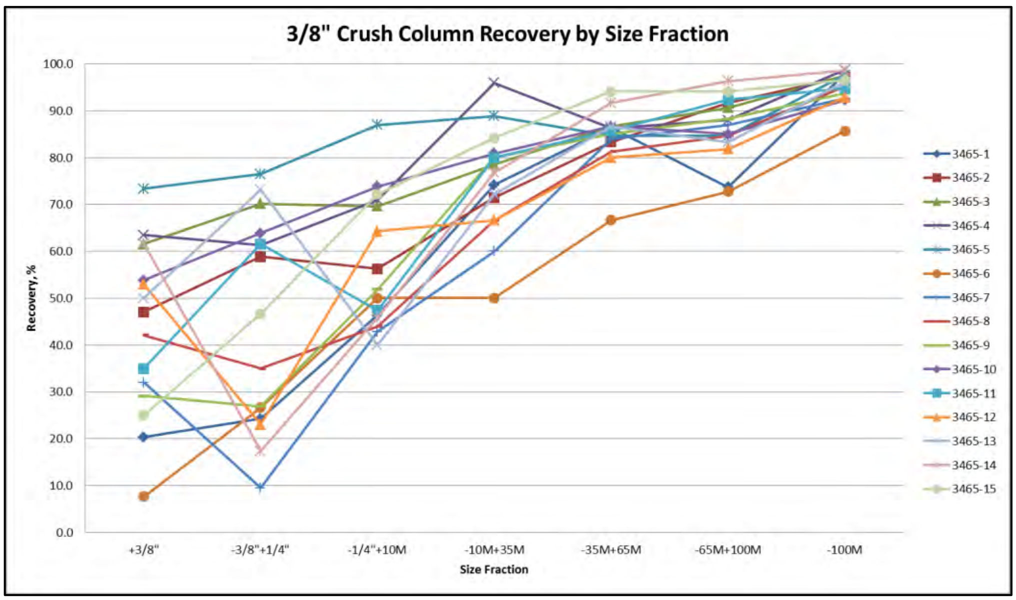
3465	12	40.0	46.7	7.8	12.7
3465	13	41.2	47.4	2.6	4.9
3465	14	30.5	47.2	5.1	8.8
3465	15	61.1	65.0	4.8	7.5
3465 Average		***48.2***	***53.6***	***9.1***	***13.9***

D.3. HASBROUCK MINE – GOLD RECOVERY BY SIZE FRACTION

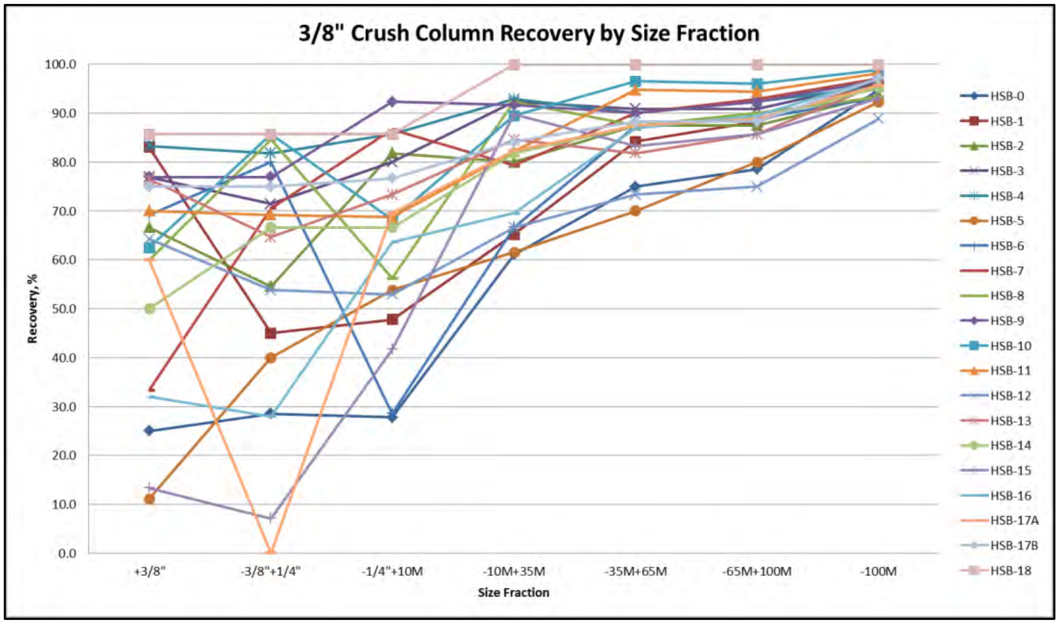
2012 test data demonstrated that gold recovery increases strongly with decreasing particle size. A head and tail screen analysis was done on each column.

2012 Hasbrouck Mine Column Leach Gold Recovery by Size Fraction

(Data from Wright, 2012)



Hasbrouck Deposit Column Leach Gold Recovery by Size Fraction
(Data from McPartland, 2012)

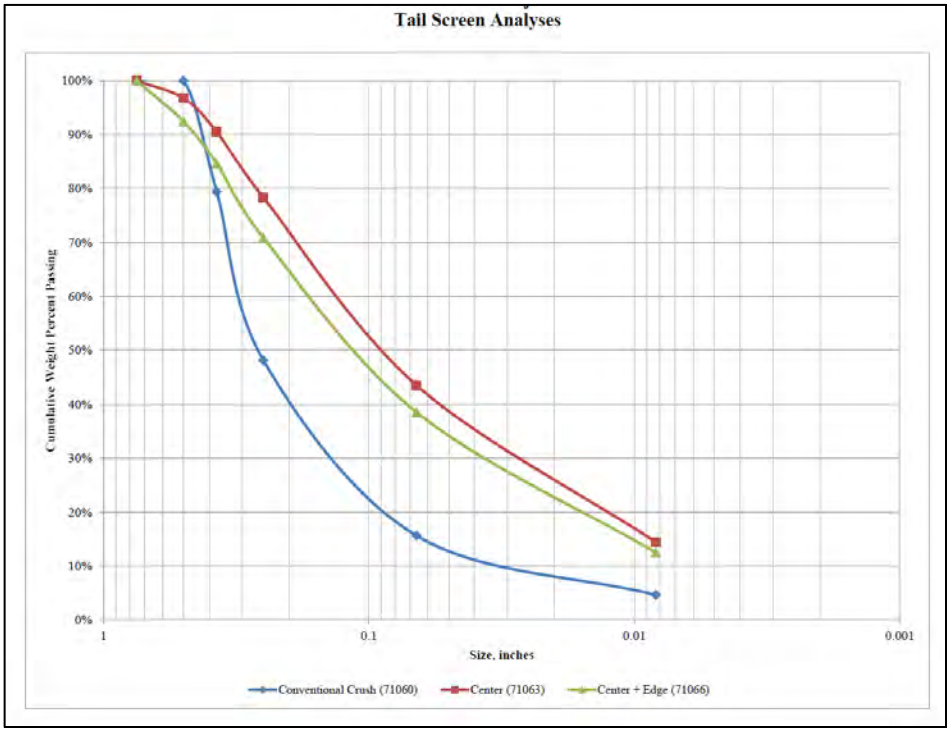


The 2012 column leach data were studied to determine the relationship between particle size and recovery. As shown in Figure 13.7 and Figure 13.8, it is clear that gold recovery increases with decreasing particle size.

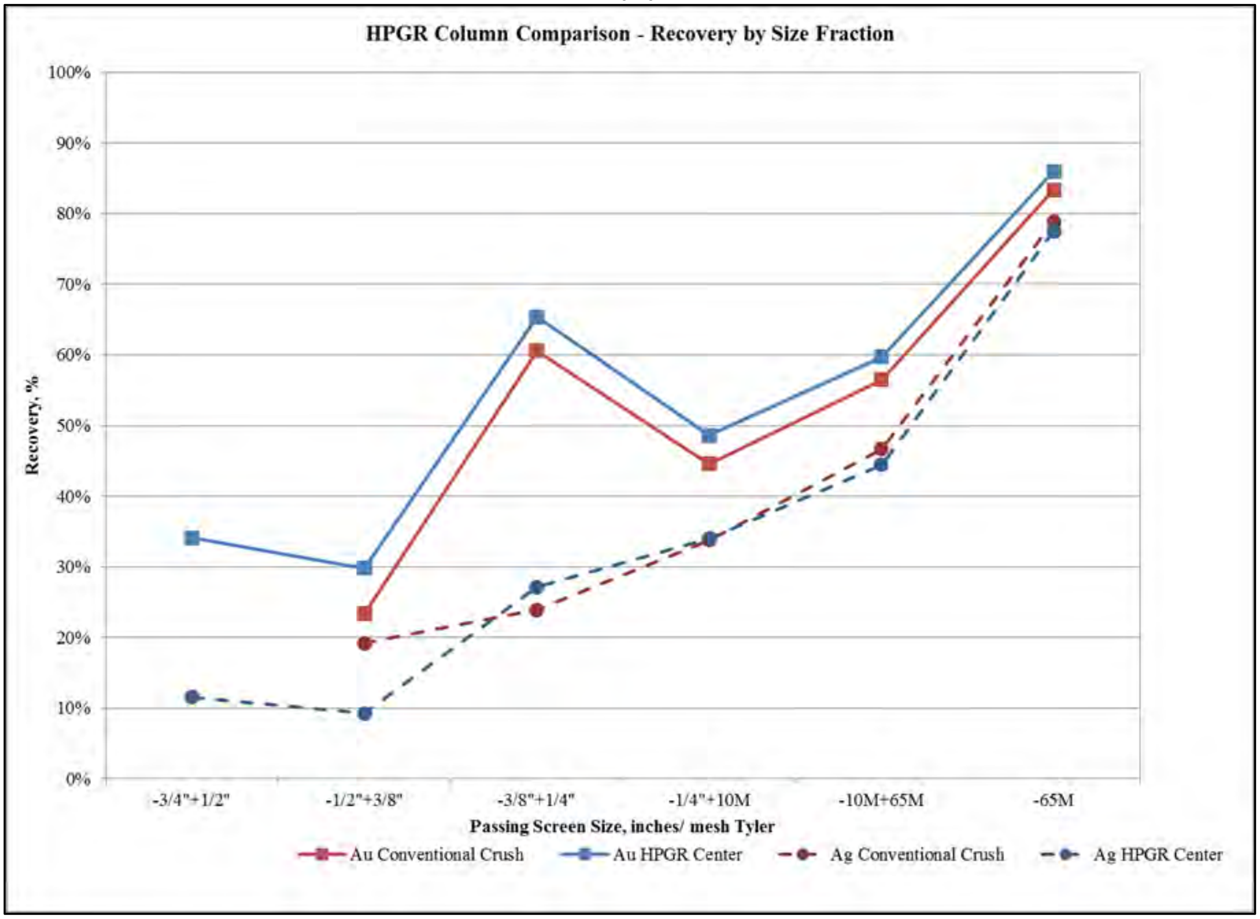
D.4. HASBROUCK DEPOSIT – HIGH-PRESSURE GRINDING ROLL TESTING

The particle size distributions of HPGR center, HPGR edge, and conventionally crushed p80 3/8in material are shown below.

Hasbrouck Deposit HPGR versus Conventional-Crush Size Distributions
(Data from KCA, 2015)



HPGR Column Recovery by Size Fraction



D.5. HASBROUCK DEPOSIT – AGGLOMERATION AND PERMEABILITY TEST RESULTS

Agglomeration tests were performed to evaluate the need to agglomerate both conventionally crushed and HPGR crushed ore. Results are summarized and show that both the HPGR and conventionally crushed material will require cement addition for a heap lift height of 25ft.

Hasbrouck Deposit Preliminary Agglomeration Testing
(Data from KCA, 2015)

KCA Test No.	71058 A	71058 B	71058 C	71058 D	71058 E	71058 F	71058 G	71058 H	71058 I	71058 J	71058 K	71058 L
Description	HPGR Composite, Conventionally Crushed				HPGR Composite, HPGR (Center Material)				HPGR Composite, Weighted Edge (24%) + Center (76%)			
Top Size of Material, inches	3/8"	3/8"	3/8"	3/8"	HPGR	HPGR	HPGR	HPGR	HPGR	HPGR	HPGR	HPGR
Dry Ore, kg	2	2	2	2	2	2	2	2	2	2	2	2
Cement, lb/ton	0	4	8	16	0	4	8	16	0	4	8	16
Water Added, mLs	0	77	79	92.5	0	86.5	62	80	0	157	122	125
Column Area, ft^2	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049
Initial Height, inches	11	10.5	10.25	10.5	8.25	9.5	10	10	8.5	9	10.25	10.75
Final Height, inches	11	10.5	10.25	10.5	8.25	9.25	10	10	8.5	9	10.25	10.75
pH on Day 3	8	10.1	10.7	11.1	7.8	10.9	11.2	11.2	7.9	9.2	9.2	10.8
pH Comment	Low	Good	Good	Good	Low	Good	Good	Good	Low	Low	Low	Good
% Slump	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
Slump Result	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Apparent Bulk Density, lb$_{dry}$/ft^3	97.99	102.66	105.16	102.66	130.65	116.53	107.79	107.79	126.81	119.77	105.16	100.27
Flow Out, gpm/ft^2	10.51	10.13	13.43	12.74	0.1	5.85	4.56	9.17	0.1	4.81	8.81	6.96
Flow Result	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Fail	Pass	Pass	Pass
Visual Estimate of % Pellet Breakdown	N/A	<3	<3	<3	N/A	<3	<3	<3	N/A	<3	<3	<3
Pellet Result	N/A	Pass	Pass	Pass	N/A	Pass	Pass	Pass	N/A	Pass	Pass	Pass
Out Flow Solution, Color and Clarity	Light Brown & Cloudy	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Brown & Cloudy	Colorless & Clear	Colorless & Clear	Colorless & Clear
Solution Result	Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass
Overall Test Result	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Fail	Pass	Pass	Pass

Results show that the agglomerates were stable and permeable with 4 lb/ton of cement. However, the pH of the effluent was low at a cement addition rate of 4 lb/ton, and thus 5 lb/ton cement is recommended to maintain pH above 10.5 in the heap.

D.6. HASBROUCK DEPOSIT – LEACH CYCLE TIME RESULTS

The 2012 Hasbrouck column test results for the -3/8in, conventionally crushed materials were studied to estimate an average value for leach cycle duration.

Hasbrouck Deposit - Summary of Leach Cycle Duration Results for Gold
(Data from KCA, 2015)

			Bending Point				Recovery Complete		
Test	Crush	Description	S/O at Bend	Rec. at Bend	Lab Days	Field Days	Recovery	Lab Days	Total Days
P-2	-3/8"	HSB-0	0.55	16.3	7	51.1	35.8	49	100
P-4	-3/8"	HSB-1	1.02	34.8	13	95.2	51.0	45	140
P-6	-3/8"	HSB-2	1.02	51.7	13	95.0	64.2	44	139
P-8	-3/8"	HSB-3	0.61	50.6	8	57.2	70.6	49	106
P-10	-3/8"	HSB-4	0.70	56.4	9	65.4	76.4	65	130
P-12	-3/8"	HSB-5	0.54	24.5	7	50.3	43.6	49	99
P-14	-3/8"	HSB-6	0.55	42.3	8	51.0	68.5	49	100
P-16	-3/8"	HSB-7	0.71	49.3	9	66.3	66.7	40	106
P-18	-3/8"	HSB-8	0.55	49.3	7	51.6	66.7	34	86
P-20	-3/8"	HSB-9	0.47	54.7	6	43.6	78.0	50	94
P-22	-3/8"	HSB-10	0.53	54.2	7	49.8	79.2	47	97
P-24	-3/8"	HSB-11	0.53	43.0	7	50.0	66.7	50	100
P-26	-3/8"	HSB-12	0.54	25.7	7	50.2	50.0	42	92
P-28	-3/8"	HSB-13	0.77	58.1	10	71.7	74.4	66	138
P-30	-3/8"	HSB-14	0.69	43.1	9	64.6	62.5	40	105
P-32	-3/8"	HSB-15	0.78	16.7	10	72.8	26.7	36	109
P-34	-3/8"	HSB-16	0.45	25.2	6	42.5	44.4	50	93
P-36	-3/8"	HSB-17A	0.78	47.1	10	72.9	67.6	89	162
P-38	-3/8"	HSB-17B	0.78	56.2	10	72.5	72.4	68	141
P-40	-3/8"	HSB-18	0.78	77.0	10	72.9	87.0	53	126
P-2	-3/8"	3465-1	0.84	22.6	12	78.4	37.1	71	149
P-4	-3/8"	3465-2	0.65	37.8	9	61.0	58.3	58	119
P-6	-3/8"	3465-3	0.80	45.6	11	74.7	66.7	64	139
P-8	-3/8"	3465-4	0.71	44.0	10	66.7	65.3	77	144
P-10	-3/8"	3465-5	0.64	63.9	9	59.9	80.6	56	116
P-12	-3/8"	3465-6	0.58	17.1	8	53.9	26.4	50	104
P-14	-3/8"	3465-7	0.65	22.7	9	60.9	36.8	43	104
P-16	-3/8"	3465-8	0.58	29.0	8	54.7	45.0	39	94
P-18	-3/8"	3465-9	0.65	33.6	9	60.6	50.0	54	115
P-20	-3/8"	3465-10	0.63	52.7	9	59.1	70.3	62	121
P-22	-3/8"	3465-11	0.59	33.7	9	55.0	50.0	55	110
P-24	-3/8"	3465-12	0.53	32.0	8	49.4	44.0	35	84
P-26	-3/8"	3465-13	0.58	33.7	8	54.2	48.4	45	99
P-28	-3/8"	3465-14	0.73	33.4	11	68.4	46.8	75	143
P-30	-3/8"	3465-15	0.64	48.5	9	60.1	64.0	57	117

Note: " = inch; S/O = Tons Solution/Tons Ore; Rec. = gold recovery in percent.

Field leach duration has been predicted based on the 2012 McClelland 6in column tests. Experience teaches that field leach durations are typically longer than the column leach durations due to solution application rates being lower and column leach mechanics of diffusion and displacement not precisely representing the flow of fluid in that occur in a heap. Generally, the greater the diameter of the column, the more closely it approximates to field leach times.

D.7. HASBROUCK DEPOSIT – LEACH CYCLE TIME RESULTS

Detailed data that was used for the summary tables presented in Section 13.4 are herein listed.

Hasbrouck Deposit Bottle Roll Test Results

(Data from McPartland, 2012, Wright, 2012, and KCA, March, 2015))

						Head Grade, oz/ton		Extraction, %		Consumption lb/ton		
Test	Description	Avg. Elev (ft)	Seibert Unit	Rock Type	Size	Au	Ag	Au	Ag	NaCN	Lime	Report
CY-1	HSB-0	5915	Upper	Tsuc/Tss	10M	0.023	0.31	39.1	22.6	0.1	2	8-Mar-12
CY-18	HSB-0	5915	Upper	Tsuc/Tss	200M	0.022	0.33	86.4	57.6	0.29	2.5	8-Mar-12
CY-2	HSB-1	5840	Upper	Tss/Tslt	10M	0.023	0.51	52.2	15.7	0.1	2.2	8-Mar-12
CY-19	HSB-1	5840	Upper	Tss/Tslt	200M	0.02	0.51	90	45.1	0.15	2.7	8-Mar-12
CY-3	HSB-2	5915	Lower	Tss	10M	0.012	0.28	66.7	28.6	0.1	2.4	8-Mar-12
CY-20	HSB-2	5915	Lower	Tss	200M	0.011	0.29	90.9	62.1	0.14	2.2	8-Mar-12
CY-4	HSB-3	5820	Lower	Tss/Tslt	10M	0.02	0.88	79.8	54.3	0.23	2.4	8-Mar-12
CY-21	HSB-3	5820	Lower	Tss/Tslt	200M	0.018	0.8	87.4	64.3	0.31	2.3	8-Mar-12
CY-5	HSB-4	5670	Lower	Tslt	10M	0.015	0.36	80	36.1	0.15	3	8-Mar-12
CY-22	HSB-4	5670	Lower	Tslt	200M	0.012	0.37	91.7	51.4	0.14	2.6	8-Mar-12
CY-6	HSB-5	6040	Upper	Tss/Tslc	10M	0.01	0.35	50	28.6	0.1	2.2	8-Mar-12
CY-23	HSB-5	6040	Upper	Tss/Tslc	200M	0.009	0.35	88.9	62.9	0.6	2.4	8-Mar-12
CY-7	HSB-6	5930	Lower	Tslt/Tsw	10M	0.012	0.21	66.7	19	0.1	3.5	8-Mar-12
CY-24	HSB-6	5930	Lower	Tslt/Tsw	200M	0.011	0.21	90.9	47.6	0.29	2.9	8-Mar-12
CY-8	HSB-7	5830	Lower	Tslt	10M	0.023	0.19	73.9	26.3	0.1	3.8	8-Mar-12
CY-25	HSB-7	5830	Lower	Tslt	200M	0.022	0.17	90.9	58.8	0.14	2.9	8-Mar-12
CY-9	HSB-8	5735	Lower	Tslt/Tsw	10M	0.013	0.14	84.6	14.3	0.1	3.1	8-Mar-12
CY-26	HSB-8	5735	Lower	Tslt/Tsw	200M	0.011	0.11	90.9	36.4	0.3	2.7	8-Mar-12
CY-10	HSB-9	5610	Lower	Tslt/Tsw	10M	0.014	0.6	85.7	11.7	0.14	2.9	8-Mar-12
CY-27	HSB-9	5610	Lower	Tslt/Tsw	200M	0.012	0.63	91.7	28.6	0.16	2.8	8-Mar-12
CY-11	HSB-10	5460	Lower	Tsw/Tslt	10M	0.022	0.85	81.8	9.4	0.1	2.6	8-Mar-12
CY-28	HSB-10	5460	Lower	Tsw/Tslt	200M	0.023	0.86	95.7	26.7	0.3	3.2	8-Mar-12
CY-12	HSB-11	5800	Upper/Lower	Tslc/Tslt	10M	0.032	0.6	71.9	10	0.15	2.6	8-Mar-12
CY-29	HSB-11	5800	Upper/Lower	Tslc/Tslt	200M	0.027	0.58	96.3	32.8	0.46	3.4	8-Mar-12
CY-13	HSB-12	5930	Upper	Tslc	10M	0.013	0.25	61.5	20	0.1	2.6	8-Mar-12
CY-30	HSB-12	5930	Upper	Tslc	200M	0.013	0.26	84.6	57.7	0.31	2.2	8-Mar-12
CY-14	HSB-13	5700	Lower	Tslt/Tslc	10M	0.019	0.46	68.4	15.2	0.1	3	8-Mar-12
CY-31	HSB-13	5700	Lower	Tslt/Tslc	200M	0.021	0.49	76.2	38.8	0.1	2.9	8-Mar-12

						Head Grade, oz/ton		Extraction, %		Consumption lb/ton		
CY-15	HSB-14	5835	Lower	Tsw/Tslt	10M	0.016	0.21	75	14.3	0.1	2.6	8-Mar-12
CY-32	HSB-14	5835	Lower	Tsw/Tslt	200M	0.012	0.17	91.7	35.3	0.1	3.8	8-Mar-12
CY-16	HSB-15	5950	Upper	Tslc	10M	0.021	0.49	47.6	30.6	0.1	2.3	8-Mar-12
CY-33	HSB-15	5950	Upper	Tslc	200M	0.018	0.48	83.3	72.9	0.1	3.4	8-Mar-12
CY-17	HSB-16	5890	Upper	Tslc/Tslt	10M	0.026	0.7	57.7	20	0.1	2.4	8-Mar-12
CY-34	HSB-16	5890	Upper	Tslc/Tslt	200M	0.027	0.63	92.6	63.5	0.1	3	8-Mar-12
CY-35	HSB-17A	5940	Lower	Tslt	10M	0.028	0.67	75	29.9	0.1	2.7	8-Mar-12
CY-38	HSB-17A	5940	Lower	Tslt	200M	0.026	0.64	88.5	60.9	0.27	3.8	8-Mar-12
CY-36	HSB-17B	5865	Lower	Tslt	10M	0.023	0.39	78.3	30.8	0.15	2.5	8-Mar-12
CY-39	HSB-17B	5865	Lower	Tslt	200M	0.027	0.49	92.6	46.9	0.29	4.2	8-Mar-12
CY-37	HSB-18	5580	Lower	Tslt	10M	0.007	0.54	85.7	18.5	0.16	2.8	8-Mar-12
CY-40	HSB-18	5580	Lower	Tslt	200M	0.009	0.58	88.9	39.7	0.15	5	8-Mar-12
CY-1	3465-1	5960	Upper	Tslc	10M	0.035	0.71	62.9	39.4	0.16	2	14-Mar-12
CY-16	3465-1	5960	Upper	Tslc	200M	0.033	0.57	90.9	54.4	0.16	2.7	14-Mar-12
CY-2	3465-2	5885	Lower	Tslt	10M	0.015	0.75	73.3	36	0.14	1.6	14-Mar-12
CY-17	3465-2	5885	Lower	Tslt	200M	0.014	0.77	92.9	54.5	0.14	2.3	14-Mar-12
CY-3	3465-3	5790	Lower	Tslt	10M	0.045	1.2	73.3	29.2	0.3	2	14-Mar-12
CY-18	3465-3	5790	Lower	Tslt	200M	0.043	1.16	90.7	50	0.14	2.6	14-Mar-12
CY-4	3465-4	5715	Lower	Tslt	10M	0.088	1.7	67	21.8	0.14	2.2	14-Mar-12
CY-19	3465-4	5715	Lower	Tslt	200M	0.078	1.67	92.3	44.9	0.16	2.6	14-Mar-12
CY-5	3465-5	5625	Lower	Tslt	10M	0.018	0.84	77.8	6	0.31	2.7	14-Mar-12
CY-20	3465-5	5625	Lower	Tslt	200M	0.017	0.78	94.1	20.5	0.14	3.2	14-Mar-12
CY-6	3465-6	6050	Upper	Tss	10M	0.014	0.31	42.9	25.8	0.14	2.2	14-Mar-12
CY-21	3465-6	6050	Upper	Tss	200M	0.012	0.25	75	68	0.15	2.8	14-Mar-12
CY-7	3465-7	5980	Upper	Tslc	10M	0.022	0.29	50	27.6	0.14	1.8	14-Mar-12
CY-22	3465-7	5980	Upper	Tslc	200M	0.017	0.24	82.4	70.8	0.15	2.9	14-Mar-12
CY-8	3465-8	5915	Upper	Tslc	10M	0.023	0.45	52.2	33.3	0.19	2	14-Mar-12
CY-23	3465-8	5915	Upper	Tslc	200M	0.019	0.34	84.2	79.4	0.14	2.6	14-Mar-12
CY-9	3465-9	5850	Lower	Tslt	10M	0.029	0.49	58.6	26.5	0.14	1.8	14-Mar-12
CY-24	3465-9	5850	Lower	Tslt	200M	0.023	0.4	87	60	0.15	2.4	14-Mar-12
CY-10	3465-10	5790	Lower	Tslt	10M	0.042	1.11	73.8	26.1	0.15	1.8	14-Mar-12
CY-25	3465-10	5790	Lower	Tslt	200M	0.038	0.91	86.8	54.9	0.14	2.1	14-Mar-12
CY-11	3465-11	5857	Lower	Tslt	10M	0.022	0.65	63.6	18.5	0.14	2.3	14-Mar-12
CY-26	3465-11	5857	Lower	Tslt	200M	0.019	0.59	94.7	49.2	0.14	2.7	14-Mar-12
CY-12	3465-12	5925	Upper	Tslc	10M	0.016	0.62	50	24.2	0.14	2.2	14-Mar-12
CY-27	3465-12	5925	Upper	Tslc	200M	0.013	0.61	76.9	59	0.15	2.6	14-Mar-12
CY-13	3465-13	5845	Upper	Tslc/Tslt	10M	0.023	0.41	52.2	14.6	0.14	1.8	14-Mar-12
CY-28	3465-13	5845	Upper	Tslc/Tslt	200M	0.031	0.43	96.8	39.5	0.14	2.1	14-Mar-12
CY-14	3465-14	5760	Lower	Tslt	10M	0.050	0.56	60	17.9	0.14	2.1	14-Mar-12

RESPEC

						Head Grade, oz/ton		Extraction, %		Consumption lb/ton		
CY-29	3465-14	5760	Lower	Tslt	200M	0.045	0.55	95.6	47.3	0.14	2.2	14-Mar-12
CY-15	3465-15	5670	Lower	Tslt	10M	0.025	0.46	68	10.9	0.14	1.8	14-Mar-12
CY-30	3465-15	5670	Lower	Tslt	200M	0.021	0.44	95.2	31.8	0.16	2.3	14-Mar-12
73109A	HSB11-014:275-335	5795	Upper/Lower	Tslc	10M	0.020	0.53	51	18	0.32	1	Jan-15
73111A	HSB11-014:275-335	5795	Upper/Lower	Tslc	200M	0.017	0.58	90	49	0.5	1.5	Jan-15
73109B	HSB11-043:494-532	5520	Lower	Tsw	10M	0.020	0.28	87	7	0.3	1.5	Jan-15
73111B	HSB11-043:494-532	5520	Lower	Tsw	200M	0.021	0.29	97	28	1.25	1.5	Jan-15
73109C	HSB11C-079:572-627	5500	Lower	Tsw	10M	0.018	0.45	84	5	0.46	1.5	Jan-15
73111C	HSB11C-079:572-627	5500	Lower	Tsw	200M	0.019	0.47	96	24	0.77	2	Jan-15
73109D	HSB11C-091:532-541:550.5-577	5565	Lower	Tslt	10M	0.022	0.16	83	11	0.32	1.5	Jan-15
73111D	HSB11C-091:532-541:550.5-577	5565	Lower	Tslt	200M	0.020	0.16	95	43	0.86	2	Jan-15
73110A	HSB11C-099:345-386	5900	Lower	Tslt	10M	0.013	0.28	68	21	0.34	1.5	Jan-15
73112A	HSB11C-099:345-386	5900	Lower	Tslt	200M	0.011	0.28	90	57	0.51	1.5	Jan-15

Note: Tslc = lower conglomerate in Upper Siebert; Tsw = tuffaceous siltstone; Tslt = latitic tuff in Lower Siebert; Tsuc = upper conglomerate in Upper Siebert; Tss = sandstone in Upper Siebert.

Hasbrouck Deposit Column Tests, Grades and Reagents
(Data from McPartland, 2012, and Wright, 2012)

						Head Grade oz/ton		Consumption, lb/ton	
Test	Description	Avg. Elev (ft)	Siebert	Rock Type	Crush Size	Au	Ag	NaCN	Lime
P-1	HSB-0	5915	Upper	Tsuc/Tss	3/4	0.014	0.30	3.12	2.0
P-2	HSB-0	5915	Upper	Tsuc/Tss	3/8	0.019	0.30	3.04	2.0
P-3	HSB-1	5840	Upper	Tss/Tslt	3/4	0.021	0.50	3.19	2.2
P-4	HSB-1	5840	Upper	Tss/Tslt	3/8	0.021	0.50	3.64	2.2
P-5	HSB-2	5915	Lower	Tss	3/4	0.013	0.25	3.38	2.4
P-6	HSB-2	5915	Lower	Tss	3/8	0.012	0.24	3.19	2.4
P-7	HSB-3	5820	Lower	Tss/Tslt	3/4	0.017	0.27	3.32	2.8
P-8	HSB-3	5820	Lower	Tss/Tslt	3/8	0.018	0.27	3.16	2.8
P-9	HSB-4	5670	Lower	Tslt	3/4	0.014	0.23	3.00	3.0
P-10	HSB-4	5670	Lower	Tslt	3/8	0.014	0.16	3.19	3.0
P-11	HSB-5	6040	Upper	Tss/Tslc	3/4	0.011	0.26	2.78	2.2
P-12	HSB-5	6040	Upper	Tss/Tslc	3/8	0.011	0.32	2.83	2.2
P-13	HSB-6	5930	Lower	Tslt/Tsw	3/4	0.016	0.21	2.25	3.6
P-14	HSB-6	5930	Lower	Tslt/Tsw	3/8	0.013	0.15	2.29	3.6
P-15	HSB-7	5830	Lower	Tslt	3/4	0.028	0.14	2.49	3.8
P-16	HSB-7	5830	Lower	Tslt	3/8	0.027	0.16	2.51	3.8
P-19	HSB-8	5735	Lower	Tslt/Tsw	3/4	0.013	0.07	2.61	3.2
P-18	HSB-8	5735	Lower	Tslt/Tsw	3/8	0.015	0.09	2.88	3.2
P-17	HSB-9	5610	Lower	Tlst/Tsw	3/4	0.013	0.57	2.64	3.0
P-20	HSB-9	5610	Lower	Tlst/Tsw	3/8	0.015	0.61	2.32	3.0
P-21	HSB-10	5460	Lower	Tsw/Tslt	3/4	0.024	0.78	0.89	2.6
P-22	HSB-10	5460	Lower	Tsw/Tslt	3/8	0.024	0.78	2.60	2.6
P-23	HSB-11	5800	Upper/Lower	Tslc/Tslt	3/4	0.034	0.60	2.59	2.6
P-24	HSB-11	5800	Upper/Lower	Tslc/Tslt	3/8	0.033	0.61	2.87	2.6
P-25	HSB-12	5930	Upper	Tslc	3/4	0.014	0.22	2.88	2.6
P-26	HSB-12	5930	Upper	Tslc	3/8	0.014	0.24	3.08	2.6
P-27	HSB-13	5700	Lower	Tslt/Tslc	3/4	0.017	0.44	3.21	3.0
P-28	HSB-13	5700	Lower	Tslt/Tslc	3/8	0.016	0.46	3.34	3.0
P-29	HSB-14	5835	Lower	Tsw/Tslt	3/4	0.014	0.19	2.86	2.6
P-30	HSB-14	5835	Lower	Tsw/Tslt	3/8	0.016	0.19	2.91	2.6
P-31	HSB-15	5950	Upper	Tslc	3/4	0.015	0.49	2.81	2.4
P-32	HSB-15	5950	Upper	Tslc	3/8	0.030	0.52	2.97	2.4
P-33	HSB-16	5890	Upper	Tslc/Tslt	3/4	0.024	0.66	2.90	2.4
P-34	HSB-16	5890	Upper	Tslc/Tslt	3/8	0.027	0.63	3.28	2.4
P-35	HSB-17A	5940	Lower	Tslt	3/4	0.031	0.60	5.33	2.6
P-36	HSB-17A	5940	Lower	Tslt	3/8	0.034	0.63	5.85	2.6

						Head Grade oz/ton		Consumption, lb/ton	
P-37	HSB-17B	5865	Lower	Tslt	3/4	0.029	0.50	4.12	2.6
P-38	HSB-17B	5865	Lower	Tslt	3/8	0.029	0.38	4.54	2.6
P-39	HSB-18	5580	Lower	Tslt	3/4	0.007	0.48	3.93	2.6
P-40	HSB-18	5580	Lower	Tslt	3/8	0.010	0.51	4.50	2.6
P-1	3465-1	5960	Upper	Tslc	3/4	0.036	0.70	3.98	2.0
P-2	3465-1	5960	Upper	Tslc	3/8	0.042	0.76	4.91	2.0
P-3	3465-2	5885	Lower	Tslt	3/4	0.016	0.72	2.68	2.0
P-4	3465-2	5885	Lower	Tslt	3/8	0.018	0.71	3.07	2.0
P-5	3465-3	5790	Lower	Tslt	3/4	0.050	1.16	3.72	2.0
P-6	3465-3	5790	Lower	Tslt	3/8	0.045	1.26	4.20	2.0
P-7	3465-4	5715	Lower	Tslt	3/4	0.074	1.45	4.72	2.0
P-8	3465-4	5715	Lower	Tslt	3/8	0.075	1.65	4.34	2.0
P-9	3465-5	5625	Lower	Tslt	3/4	0.020	0.78	3.48	2.5
P-10	3465-5	5625	Lower	Tslt	3/8	0.018	0.85	3.75	2.5
P-11	3465-6	6050	Upper	Tss	3/4	0.013	0.29	2.55	2.0
P-12	3465-6	6050	Upper	Tss	3/8	0.014	0.33	2.58	2.0
P-13	3465-7	5980	Upper	Tslc	3/4	0.019	0.26	2.66	2.0
P-14	3465-7	5980	Upper	Tslc	3/8	0.022	0.27	2.81	2.0
P-15	3465-8	5915	Upper	Tslc	3/4	0.022	0.47	2.87	2.0
P-16	3465-8	5915	Upper	Tslc	3/8	0.020	0.47	3.09	2.0
P-17	3465-9	5850	Lower	Tslt	3/4	0.026	0.49	3.33	2.0
P-18	3465-9	5850	Lower	Tslt	3/8	0.028	0.46	3.23	2.0
P-19	3465-10	5790	Lower	Tslt	3/4	0.037	0.99	3.14	2.0
P-20	3465-10	5790	Lower	Tslt	3/8	0.037	1.00	3.38	2.0
P-21	3465-11	5857	Lower	Tslt	3/4	0.020	0.69	2.99	2.0
P-22	3465-11	5857	Lower	Tslt	3/8	0.019	0.66	2.97	2.0
P-23	3465-12	5925	Upper	Tslc	3/4	0.015	0.64	2.11	2.0
P-24	3465-12	5925	Upper	Tslc	3/8	0.015	0.63	2.11	2.0
P-25	3465-13	5845	Upper	Tslc/Tslt	3/4	0.017	0.39	2.24	2.0
P-26	3465-13	5845	Upper	Tslc/Tslt	3/8	0.019	0.41	2.63	2.0
P-27	3465-14	5760	Lower	Tslt	3/4	0.059	0.59	4.01	2.0
P-28	3465-14	5760	Lower	Tslt	3/8	0.053	0.57	3.97	2.0
P-29	3465-15	5670	Lower	Tslt	3/4	0.018	0.42	2.79	2.0
P-30	3465-15	5670	Lower	Tslt	3/8	0.020	0.40	2.77	2.0

Note: Tslc = lower conglomerate in Upper Siebert; Tsw = tuffaceous siltstone; Tslt = latitic tuff in Lower Siebert; Tss = sandstone in Upper Siebert.

Hasbrouck Deposit Column Tests, Extractions and Tails
(Data from McPartland, 2012, and Wright, 2012)

				Extracted, %		Tails Grade, oz/ton	
Test	**Description**	**Siebert Unit**	**Crush Size (inches)**	**Au**	**Ag**	**Au**	**Ag**
P-1	HSB-0	Upper	P80 3/4	42.9	13.3	0.008	0.26
P-2	HSB-0	Upper	P80 3/8	36.8	16.7	0.012	0.25
P-3	HSB-1	Upper	P80 3/4	38.1	8.0	0.013	0.46
P-4	HSB-1	Upper	P80 3/8	52.4	12.0	0.010	0.44
P-5	HSB-2	Lower	P80 3/4	61.5	12.0	0.005	0.22
P-6	HSB-2	Lower	P80 3/8	66.7	16.7	0.004	0.20
P-7	HSB-3	Lower	P80 3/4	64.7	3.7	0.006	0.26
P-8	HSB-3	Lower	P80 3/8	72.2	7.4	0.005	0.25
P-9	HSB-4	Lower	P80 3/4	71.4	4.3	0.004	0.22
P-10	HSB-4	Lower	P80 3/8	78.6	9.1	0.003	0.20
P-11	HSB-5	Upper	P80 3/4	36.4	19.2	0.007	0.21
P-12	HSB-5	Upper	P80 3/8	45.5	18.8	0.006	0.26
P-13	HSB-6	Lower	P80 3/4	56.3	4.8	0.007	0.20
P-14	HSB-6	Lower	P80 3/8	69.2	6.7	0.004	0.14
P-15	HSB-7	Lower	P80 3/4	67.9	7.1	0.009	0.13
P-16	HSB-7	Lower	P80 3/8	66.7	12.5	0.009	0.14
P-19	HSB-8	Lower	P80 3/4	69.2	14.3	0.004	0.06
P-18	HSB-8	Lower	P80 3/8	66.7	11.1	0.005	0.08
P-17	HSB-9	Lower	P80 3/4	84.6	10.5	0.002	0.51
P-20	HSB-9	Lower	P80 3/8	80.0	8.2	0.003	0.56
P-21	HSB-10	Lower	P80 3/4	75.0	5.1	0.006	0.74
P-22	HSB-10	Lower	P80 3/8	79.2	6.4	0.005	0.73
P-23	HSB-11	Upper/Lower	P80 3/4	55.9	5.0	0.015	0.57
P-24	HSB-11	Upper/Lower	P80 3/8	66.7	6.6	0.011	0.57
P-25	HSB-12	Upper	P80 3/4	50.0	13.6	0.007	0.19
P-26	HSB-12	Upper	P80 3/8	50.0	16.7	0.007	0.20
P-27	HSB-13	Lower	P80 3/4	64.7	6.8	0.006	0.41
P-28	HSB-13	Lower	P80 3/8	75.0	10.9	0.004	0.41
P-29	HSB-14	Lower	P80 3/4	64.3	5.3	0.005	0.18
P-30	HSB-14	Lower	P80 3/8	62.5	10.5	0.006	0.17
P-31	HSB-15	Upper	P80 3/4	40.0	16.3	0.009	0.41
P-32	HSB-15	Upper	P80 3/8	26.7	23.1	0.022	0.40
P-33	HSB-16	Upper	P80 3/4	41.7	9.1	0.014	0.60
P-34	HSB-16	Upper	P80 3/8	44.4	14.3	0.015	0.54

				Extracted, %		Tails Grade, oz/ton	
P-35	HSB-17A	Lower	P80 3/4	58.1	20.0	0.013	0.48
P-36	HSB-17A	Lower	P80 3/8	67.6	23.8	0.011	0.48
P-37	HSB-17B	Lower	P80 3/4	58.6	14.0	0.012	0.43
P-38	HSB-17B	Lower	P80 3/8	72.4	28.9	0.008	0.27
P-39	HSB-18	Lower	P80 3/4	85.7	8.3	0.001	0.44
P-40	HSB-18	Lower	P80 3/8	90.0	15.7	0.001	0.43
P-1	3465-1	Upper	P80 3/4	33.3	18.6	0.024	0.57
P-2	3465-1	Upper	P80 3/8	38.1	22.4	0.026	0.59
P-3	3465-2	Lower	P80 3/4	50.0	13.9	0.008	0.62
P-4	3465-2	Lower	P80 3/8	61.1	23.9	0.007	0.54
P-5	3465-3	Lower	P80 3/4	60.0	12.9	0.020	1.01
P-6	3465-3	Lower	P80 3/8	66.7	18.3	0.015	1.03
P-7	3465-4	Lower	P80 3/4	73.0	8.3	0.020	1.33
P-8	3465-4	Lower	P80 3/8	65.3	12.7	0.026	1.44
P-9	3465-5	Lower	P80 3/4	75.0	2.6	0.005	0.76
P-10	3465-5	Lower	P80 3/8	83.3	3.5	0.003	0.82
P-11	3465-6	Upper	P80 3/4	23.1	6.9	0.010	0.27
P-12	3465-6	Upper	P80 3/8	28.6	12.1	0.010	0.29
P-13	3465-7	Upper	P80 3/4	31.6	7.7	0.013	0.24
P-14	3465-7	Upper	P80 3/8	36.4	14.8	0.014	0.23
P-15	3465-8	Upper	P80 3/4	36.4	14.9	0.014	0.40
P-16	3465-8	Upper	P80 3/8	45.0	23.4	0.011	0.36
P-17	3465-9	Lower	P80 3/4	50.0	10.2	0.013	0.44
P-18	3465-9	Lower	P80 3/8	50.0	15.2	0.014	0.39
P-19	3465-10	Lower	P80 3/4	73.0	16.2	0.010	0.83
P-20	3465-10	Lower	P80 3/8	70.3	20.0	0.011	0.80
P-21	3465-11	Lower	P80 3/4	45.0	4.3	0.011	0.66
P-22	3465-11	Lower	P80 3/8	52.6	7.6	0.009	0.61
P-23	3465-12	Upper	P80 3/4	40.0	7.8	0.009	0.59
P-24	3465-12	Upper	P80 3/8	46.7	12.7	0.008	0.55
P-25	3465-13	Upper	P80 3/4	41.2	2.6	0.010	0.38
P-26	3465-13	Upper	P80 3/8	47.4	4.9	0.010	0.39
P-27	3465-14	Lower	P80 3/4	30.5	5.1	0.041	0.56
P-28	3465-14	Lower	P80 3/8	47.2	8.8	0.028	0.52
P-29	3465-15	Lower	P80 3/4	61.1	4.8	0.007	0.40
P-30	3465-15	Lower	P80 3/8	65.0	7.5	0.007	0.37

D.8. HASBROUCK DEPOSIT – METALLURGIAL COMPOSITES DETERMINED FOR UPPER AND LOWER SEIBERT

Data was used for Figure 13-10 and the summary presented in Section 13.4.6.4 for the Upper Seibert formation.

3536						Au_rec_pct			
ANV_Met_Comp	**Hole_ID**	**from**	**to**	**avg_depth**	**avg_elev**	**Bottle (-10mesh)**	**Column (3/8")**	**Seibert**	**rock type**
HSB-0	HSB10-004	50	130	90	5915	39	36.8	Upper	Tsuc/Tss
HSB-1	HSB10-004	135	210	172.5	5840	52	52.4	Upper	Tss/Tslt
HSB-5	HSB10-008	67	170	118.5	6040	50	45.5	Upper	Tss/Tslc
HSB-12	HSB10-011	70	210	140	5930	62	50.0	Upper	Tslc
HSB-15	HSB10-007	5	75	40	5950	48	26.7	Upper	Tslc
HSB-16	HSB10-007	80	145	112.5	5890	58	44.0	Upper	Tslc/Tslt
						51.5	**42.6**		
3465									
ANV_Met_Comp	**Hole_ID**	**from**	**to**	**avg_depth**	**avg_elev**	**Bottle (10M)**	**Column (3/8")**	**Seibert**	**rock type**
3465-1	HSB-10-001	0	95	47.5	5960	63	38.1	Upper	Tslc
3465-6	HSB-10-002	0	70	35	6050	43	28.6	Upper	Tss
3465-7	HSB-10-002	70	135	102.5	5980	50	36.4	Upper	Tslc
3465-8	HSB-10-002	135	200	167.5	5915	52	45.0	Upper	Tslc
3465-9	HSB-10-002	200	270	235	5850	59	50.0	Upper	
3465-12	HSB-10-003	155	220	187.5	5925	50	46.7	Upper	Tslc
3465-13	HSB-10-003	220	320	270	5845	52	47.4	Upper	Tslc/Tslt
3465-14	HSB-10-003	320	395	357.5	5760	60	47.2	Upper	
						52.6	**41.7**		
Weighted Average						**52.4%**	**42.4%**		

Data used for Figure 13.10 and the summary presented in Section 13.4.6.4 for the lower Seibert formation.

3536	Hole_ID	from	to	avg_depth	avg_elev	Bottle (-200 mesh)	Bottle (-10mesh)	Column (3/8")	Seibert
HSB-2	HSB10-006	290	380	335	5915	90.9	67	67.0	Lower
HSB-3	HSB10-006	385	475	430	5820	87.4	80	72.0	Lower
HSB-4	HSB10-006	525	640	582.5	5670	91.7	80	79.0	Lower
HSB-6	HSB10-008	200	270	235	5930	90.9	67	69.0	Lower
HSB-7	HSB10-008	305	375	340	5830	90.9	74	67.0	Lower
HSB-8	HSB10-008	395	465	430	5735	90.9	85	67.0	Lower
HSB-9	HSB10-009	320	470	395	5610	91.7	86	80.0	Lower
HSB-10	HSB10-009	470	615	542.5	5460	95.7	82	79.0	Lower
HSB-11	HSB10-010	180	285	232.5	5800		72	66.7	Lower
HSB-13	HSB10-011	215	447	331	5700	76.2	68	75.0	Lower
HSB-14	HSB10-016	5	150	77.5	5835	91.7	75	63.0	Lower
HSB-17A	HSB10-013	0	70	35	5940	88.5	75	67.6	Lower
HSB-17B	HSB10-013	70	145	107.5	5865	92.6	78	72.4	Lower
						89.9	**76.1**	**71.1**	
3465	**Hole_ID**	**from**	**to**	**avg_depth**	**avg_elev**	**Bottle (-200 mesh)**	**Bottle (-10mesh)**	**Column (3/8")**	**Seibert**
3465-3	HSB-10-001	170	265	217.5	5790	90.7	73	66.7	Lower
3465-4	HSB-10-001	265	345	305	5715	92.3	67	65.3	Lower
3465-5	HSB-10-001	345	443	394	5625	94.1	78	83.3	Lower
3465-10	HSB-10-002	270	325	297.5	5790	86.8	74	70.3	Lower
3465-15	HSB-10-003	395	495	445	5670	95.2	68	65.0	Lower
						91.8	**72.0**	**70.1**	
Weighted Average						**90.5**	**73.4%**	**69.6%**	
Difference								**73.4%**	