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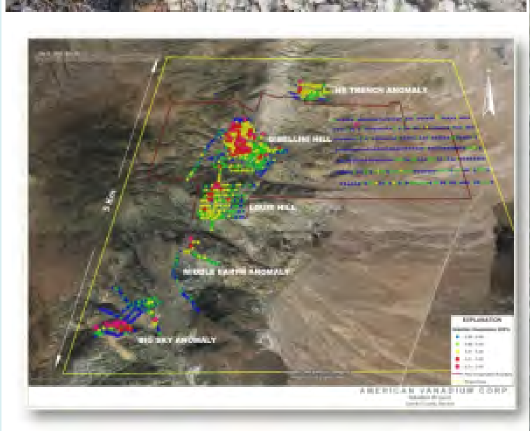
Gibellini Vanadium Project

Eureka County, Nevada, USA

NI 43-101 Technical Report on Feasibility Study



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Effective Date: 31 August 2011
Project Number: 166363

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This certificate applies to the Technical Report entitled "Gibellini Vanadium Project Eureka County, Nevada, USA NI 43-101 Technical Report on Feasibility Study" (the Technical Report) with an effective date of 31 August 2011.

I am registered as a Professional Engineer in the State of Nevada (# 10640).

I graduated with a B.Sc. degree from Montana Tech of the University of Montana, Butte, Montana in 1989 and from Boise State University, Boise, Idaho with a MBA in 2003.

I have over 20 years of experience in the mining industry, predominately at hard rock open pit mines.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 *Standards of Disclosure for Mineral Projects* (NI 43–101).

I have visited the Gibellini Project on 23 June, 2008 and again on 17 November, 2010.

I am responsible for Sections 1, 2, 3, 4, 5, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27.

I am independent of American Vanadium Corp as independence is described by Section 1.5 of NI 43-101.

I have been involved with the Gibellini Project since 2008 during the preparation of a preliminary assessment, and was a co-author on the following technical report:

Hanson, K., Wakefield T., Orbock, E., and Rust, J.C., 2010: Rocky Mountain Resources NI 43-101 Technical Report Gibellini Vanadium Project Nevada, USA: unpublished technical report prepared by AMEC E&C Services Inc. for RMP Resources Corporation, effective date 8 October 2008

I have read NI 43–101 and the portions of the Report for which I am responsible have been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, those sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

“signed and sealed”

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I am a Corporate Member of the Australasian Institute of Mining and Metallurgy (M.AusIMM, # 223090), and a Registered Member of the Society of Mining, Metallurgy and Exploration #4038771.

I graduated from the University of Nevada with a Master of Science in Economic Geology degree in 1992. I have practiced my profession from 1981 through 2001 and continuously since 2005 and have been involved in mining operations in Nevada and California and preparation of scoping, pre-feasibility, and feasibility level studies for projects in USA, Canada, and Peru

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 *Standards of Disclosure for Mineral Projects* (NI 43–101).

I visited the Gibellini Project on 23 June 2008 and again on 17 November 2010.

I am responsible for Sections 6, 7, 8, 9, 10, 11, 12, and the portions of Section 14 that pertain to Mineral Resource estimation of the Gibellini Hill deposit (14.1, 14.3, 14.4, and 14.5), and those portions of the Summary, Interpretations and Conclusions and Recommendations that pertain to those Sections of the Technical Report.

I am independent of American Vanadium Corp as independence is described by Section 1.5 of NI 43-101.

I have been involved with the Gibellini Project since 2007 during the preparation of an initial mineral resource estimate and subsequent completion of a preliminary assessment, and was a co-author on the following technical reports:

Wakefield, T., and Orbock, E., 2007: 43-101 Technical Report Gibellini Property Eureka County, Nevada: unpublished technical report prepared by AMEC E&C Services Inc. for RMP Resources Corporation, effective date 18 April, 2007

Hanson, K., Wakefield T., Orbock, E., and Rust, J.C., 2010: Rocky Mountain Resources NI 43-101 Technical Report Gibellini Vanadium Project Nevada, USA: unpublished technical report prepared by AMEC E&C Services Inc. for RMP Resources Corporation, effective date 8 October 2008

I have read NI 43–101 and the portions of the Report for which I am responsible have been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, those sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

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I am registered as a Professional Geologist by the State of Arizona Board of Technical Registration (# 47588), and am a Registered Member of the Society of Mining, Metallurgy and Exploration

I graduated from Southern Illinois University, Carbondale, Illinois in 1978 with a B.S. degree in Geology and from Metropolitan State College, Denver Colorado, in 1987 with a B.S. degree in Mathematics.

I have practiced my profession for 28 years. I have been directly involved in exploration, resource and reserve estimation, geologic modeling and mine planning for a variety of commodities including uranium, oil, copper, cobalt, gold, silver and industrial minerals.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 *Standards of Disclosure for Mineral Projects* (NI 43–101).

I have not visited the Gibellini Project.

I am respon sible for that portion of S ection 14 th at pertains to Mineral R esource estimation of the Louie Hill deposit (14.2, 14.3, 14.4, and 14.5), and those porti ons of the Summary, Interpretations and Conclusions and Recommendations that pertain to that Section.

I am independent of American Vanadium Corp as independence is described by Section 1.5 of NI 43-101.

I have no previous involvement with the Gibellini Project.

I have read NI 43–101 and the portions of the Report for which I am responsible have been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, those sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

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This certificate applies to the Technical Report entitled "Gibellini Vanadium Project Eureka County, Nevada, USA NI 43-101 Technical Report on Feasibility Study" (the Technical Report) with an effective date of 31 August 2011.

I am a registered member of the Society of Mining, Metallurgy and Exploration (#852800). I graduated from Plattsburgh State University College Bachelors Science Degree in Chemistry in 1974 and New Mexico Institute of Mining and Technology Masters of Science in Chemistry in 1976.

I have practiced my profession for 35 years. I have been directly involved in underground and open pit mining operations, hydrometallurgical and mineral processing facilities, mining project development and metallurgical research & development and design and engineering of processing facilities in USA, Canada, Brazil, Peru, Australia, Turkey, Argentina, Nicaragua, Honduras, Panama, El Salavador and CIS.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 *Standards of Disclosure for Mineral Projects* (NI 43–101).

I visited the Gibellini Project on 17 November 2010.

I am responsible for Sections 13 and 17, and those portions of the Summary, Interpretations and Conclusions and Recommendations that pertain to those Sections.

I am independent of American Vanadium Corp as independence is described by Section 1.5 of NI 43-101.

I have been involved with the Gibellini Project since 2010 during the preparation of the feasibility study.

I have read NI 43–101 and the portions of the Report for which I am responsible have been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, those sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

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1.0 SUMMARY

AMEC Americas Limited (AMEC) was commissioned by American Vanadium US Inc., a wholly-owned subsidiary of American Vanadium Corp. (American Vanadium) to prepare a technical report (the Report) on the results of a Feasibility Study completed on the wholly-owned Gibellini Vanadium Project (the Project), located within Eureka County, Nevada. The Feasibility Study was completed in August, 2011.

American Vanadium is using the Report in support of a press release dated 12 September 2011, entitled "American Vanadium Announces Positive Feasibility Study for Gibellini Vanadium Project".

1.1 Key Outcomes

- Total Proven and Probable Mineral Reserves of 19,969 kt grading 0.30% V_2O_5.
- Capital cost of US $95.5 million.
- Operating costs of $48 million per year; $16.31 per ton leached
- The pre-tax net present value (NPV) at seven percent is $226.3 million and the internal rate of return (IRR) is 51 percent.
- The after tax NPV is $170.1 million and the IRR is 43 percent.
- Payback for the Project is estimated at 2.06 years and 2.38 years for the pre-tax and after tax scenarios respectively.

1.2 Location, Climate, and Access

The Project is situated on the east flank of the Fish Creek Range in the Fish Creek Mining District, about 25 miles south of Eureka, and is accessed by dirt road extending westward from State Route 379.

The 24.5 miles leading to the mine site is State owned and is either paved or improved gravel. The three miles of road access from Nevada State Route 379 to the mine is a two-track dirt road, however, it can be upgraded to service the mine. This upgraded road would be the prime method of transport for goods and materials in and out of the Project.

The climate is typical of the dry Basin-and-Range conditions of northern Nevada. Exploration is possible year round, though snow levels in winter and wet conditions in late autumn and in spring can make travel on dirt and gravel roads difficult. It is expected that mining operations will be able to be conducted year-round.

Nevada has a long mining history and a large resource of equipment and skilled personnel. Local resources necessary for the exploration and possible future development and operation of the Gibellini Project are located in Eureka. Some resources would likely have to be brought in from the Elko and Ely areas.

1.3 Mineral Tenure

The Gibellini Project encompasses an area of approximately 4,254 acres. The Project consists of seven placer claims and 232 unpatented lode mining claims. Claims are held in the names of a number of third parties, with whom American Vanadium has agreements, and in the name of American Vanadium's predecessor company, Rocky Mountain Resources (RMP). Third-party claim agreements under which American Vanadium has a 100% interest include the 40-claim Dietrich Lease, the 12-claim MSM Lease, and the 17-claim Vanadium International Corp. Lease. American Vanadium holds 100% title to the remaining claims.

Unpatented mining claims are kept active through payment of a maintenance fee due by 1 September of each year. American Vanadium advised AMEC that payments for 2011 were appropriately lodged. There has been no legal survey of the Project claims. Under Nevada law, each unpatented claim is marked on the ground, and does not require survey.

1.4 Agreements and Royalties

American Vanadium has confirmed that a total of 70 claims are held by way of agreement with third-parties. Royalties are associated with these agreements as follows:

- Dietrich royalty: 2.5 percent NSR until royalty payments reach a total of $3 million, where the royalty decreases to 2.0 percent
- MSM royalty: production royalty of 3.0 percent NSR
- Vanadium International royalty: production royalty of 2.5 percent NSR until royalty payments reach a total of $1 million, then the royalty is dropped.

1.5 Surface and Water Rights

The Gibellini Project is situated entirely on public lands that are administered by the Bureau of Land Management (BLM). No easements or rights of way are required for access over public lands. American Vanadium advised AMEC that as at 1 September 2011, the company held no surface rights in the Project area.

Water will be supplied to the proposed mine via a buried conveyance pipeline from the Don Hull ranch located approximately 14 miles northeast of the planned mine site.

1.6 Environment, Permitting and Socio-Economics

Baseline studies have commenced, and include studies to document the existing conditions of biological resources, cultural resources, surface water resources, ground water resources, and waste rock geochemical characterization. The baseline data collected is subject to review and approval by the BLM and the NDEP and other cooperating agencies and is considered preliminary at this stage in the permitting and planning process.

No key environmental issues have been identified at this stage in the permitting and planning process. The agency scoping and preparation of the NEPA document will include the identification of issues that will guide the analysis to appropriately address any concerns or questions that may arise in relationship to the implementation of the proposed action.

American Vanadium will submit a Plan of Operations and Nevada Reclamation Permit Application (Plan) (Record Number NVN-088878) to the BLM and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) for the Project. This Plan will be is submitted in accordance with BLM Surface Management Regulations 43 Code of Federal Regulations (CFR) 3809, as amended, and Nevada reclamation regulations at Nevada Administrative Code (NAC) 519A. American Vanadium has contracted Enviroscientists, Inc. (Enviroscientists) to prepare the Plan document. If the BLM decides that an Environmental Assessment (EA) document is the appropriate level of analysis, American Vanadium will contract a third party contractor to prepare the EA.

The Nevada Bureau of Mining Regulation and Reclamation (BMRR) will need to issue a Mining Reclamation Permit and a Water Pollution Control Permit (WPCP). The Plan of Operation document described above fulfills the requirements of the application for the Mining Reclamation Permit. Application review takes the BMRR approximately 180 days from submittal and will include a public notice. The BLM and the BMRR will jointly agree on the reclamation bond amount.

American Vanadium is currently conducting the necessary environmental, geotechnical, and laboratory testing to support a closure plan for the Project. Standard reclamation measures will be described in the Plan of Operations/Nevada Reclamation Permit Application developed for the project. A Closure Plan will be developed and updated throughout the life of the Project. A final Closure Plan will need to be submitted and approved approximately two years prior to the commencement of closure and final reclamation activities of the Project.

The Nevada Standardized Reclamation Cost Estimator (SRCE) was used to estimate reclamation cost for the project to support the Feasibility Study. Enviroscientists' preliminary estimate for reclamation and closure costs is $14.6 million.

1.7 Geology and Mineralization

The Gibellini property occurs on the east flank of the southern part of the Fish Creek Range. The Gibellini Hill deposit occurs within an allocthonous fault wedge of organic-rich siliceous mudstone, siltstone, shales, and chert, which forms a northwest trending prominent ridge. These rocks are mapped as the Gibellini facies of the Woodruff Formation of Devonian Age.

The black shale unit which hosts the vanadium Mineral Resources is from 175 to over 300 feet thick and overlies gray mudstone. The shale has been oxidized to various hues of yellow and orange up to a depth of 100 feet. Alteration (oxidation) of the rocks is classified as one of three oxide codes: oxidized, transitional, and reduced. Vanadium grade changes across these boundaries. The transitional zone reports the highest average vanadium grades and American Vanadium geologists interpret this zone to have been upgraded by supergene processes.

Mineralization is tabular, conformable with bedding, and remarkably continuous in grade and thickness between drill holes. In the oxidized zone, complex vanadium oxides occur in fractures in the sedimentary rocks including metahewettite ($CaV_6O_{16}{\cdot}H_2O$), bokite ($KAl_3Fe_6V_{26}O_{76}{\cdot}30H_2O$), schoderite ($Al_2PO_4VO_4{\cdot}8H_2O$), and metaschoderite ($Al_2PO_4VO_4{\cdot}6\text{-}8H_2O$). In the reduced sediments, vanadium occurs in organic material (kerogen) made up of fine grained, flaky, and stringy organism fragments less than 15 micrometers in size.

Similarities with the style of mineralization for the Project exist in the USGS manganese nodule model, model 33a of Cox and Singer (1986). Vanadium mineralization is thought to be the result of syngenetic and early diagenetic metal concentration in the marine shale rocks.

1.8 Exploration

Work completed on the Project prior to American Vanadium's involvement was undertaken by a number of companies, including Terteling & Sons (1964–1965), Atlas and TransWorld Resources (1969), Noranda (1972–1975), and Inter-Globe (1989).

Work conducted comprised rotary drilling, trenching, mapping, metallurgical testing, and mineral resource estimation.

RMP acquired the Project in 2006, changing its name to American Vanadium in early 2011. Work conducted included review of existing data, geological mapping, an XRF survey, RC and diamond drilling, additional metallurgical testwork, and mineral resource estimation. A Preliminary Assessment was completed in 2008; this indicated, under the assumptions in the study, positive Project economics and that a heap leach operation producing vanadium pentoxide was the most likely process flowsheet for more detailed studies. A Feasibility Study was commissioned in late 2010.

In the opinion of the QPs, the exploration programs completed to date by American Vanadium are appropriate to the style of the deposits and prospects within the Project. The exploration and research work supports the genetic and affinity interpretations.

1.9 Exploration Potential

Significant exploration potential remains in the Project area. The Feasibility Study is based only on the Gibellini Hill deposit, and does not include Louie Hill. American Vanadium's recent XRF survey has identified three additional vanadium oxide anomalies in the Project area.

1.10 Drilling

A total of 280 drill holes (about 51,265 ft) have been completed on the Gibellini Project since 1946, comprising 16 core holes (4,046 ft), 169 rotary drill holes (25,077 ft; note not all drill holes have footages recorded) and 95 RC holes (22,142 ft).

All legacy drill and trench data in the Gibellini Project resource database were entered by AMEC and accurately represent the source documents. Documentation of drilling methods employed by the various legacy operators at Gibellini is sparse. No cuttings, assay rejects, or pulps remain from these drilling campaigns. No records remain for the drill sampling methods employed by NBGM (core), Terteling (rotary), or Atlas (rotary). Noranda and Inter-Globe collected drill samples on five foot intervals. American Vanadium has performed drill twins on selected Noranda and Atlas drill holes. For portions of the legacy data, the names of the laboratories that performed the assays are known; however, no information is available as to the credentials of the analytical laboratories used for the drill campaigns prior to the RMP drilling.

Drill data collected by American Vanadium meets industry standards for exploration of oxide vanadium deposits. No material factors were identified with the drill data collection that could affect Mineral Resource or Mineral Reserve estimation. RC and core methods sampling employed by RMP and American Vanadium are in line with industry norms. Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure for the RMP and American Vanadium drill programs. The RMP and American Vanadium core and RC samples were analysed by reputable independent, accredited laboratories using analytical methods appropriate to the vanadium concentration. Drill data are typically verified prior to Mineral Resource and Mineral Reserve estimation, by running a software program check.

Drill sampling has been adequately spaced to first define, then infill, vanadium anomalies to produce prospect-scale and deposit-scale drill data. Drill hole spacing varies with depth. Drill hole spacing increases with depth as the number of holes decrease and holes deviate apart. Drilling is more widely-spaced on the edges of the Gibellini Hill and Louie Hill deposits. Sample data collected adequately reflect deposit dimensions, true widths of mineralization, and the style of the deposits.

AMEC completed a database audit in 2008. Conclusions from that audit were that the data were generally acceptable for Mineral Resource estimation. Data made available after the 2008 review were audited in 2010. Conclusions from that audit were that corrections were required to Noranda and Atlas assay data, and that additional twin holes should be drilled to verify Atlas data.

In the opinion of the QPs, the quantity and quality of the lithological, geotechnical, collar survey and downhole survey data collected in the exploration and infill drill programs completed by American Vanadium on the Project are sufficient to support Mineral Resource and Mineral Reserve estimation. Legacy data are appropriate for use in estimation, but Atlas assays within the transition domain and Noranda assays within the reduced domain should be down-graded.

1.11 Metallurgical Testwork

Metallurgical testwork and associated analytical procedures were performed by recognized testing facilities, and the tests performed were appropriate to the mineralization type.

Samples selected for testing were representative of the various types and styles of mineralization at Gibellini Hill. Samples were selected from a range of depths within the deposit. Sufficient samples were taken to ensure that tests were performed on sufficient sample mass.

The process recovery for the feasibility column test worked showed a slow ascending trend of between 0.1 percent and 0.4 percent per day, which was consistent with the trend seen in the 2008 PA column test work.

Life-of-mine average recoveries are 60 percent for Oxide material and 70 percent for Transition material. No processing factors were identified from the metallurgical testwork completed to date that would have a significant effect on extraction.

1.12 Mineral Resource Estimation

Two mineral resource estimates have been performed, one at Louie Hill and the second at Gibellini Hill.

1.12.1 Gibellini Hill

Geological models were developed by American Vanadium geologists, and included oxidation domains and a grade envelope. Assays were composited along the trace of the drill hole to 10-foot fixed lengths at Gibellini Hill; oxidation boundaries were treated as hard during composite construction.

Tonnage factors were calculated from specific gravity measurements and assigned to the blocks based on oxidation domain.

AMEC did not cap Gibellini Hill assays, but capped three high-grade composites greater than 1.5% V_2O_5 to 1.5% V_2O_5. AMEC allowed all composites to interpolate grade out to 110 feet and capped composites greater than 1% V_2O_5 to 1% V_2O_5 beyond 110 feet.

Variography, using correlograms, was performed to establish anisotropy ellipsoids and the nugget value.

Only composites from RMP, Noranda, Inter-Globe, and Atlas were used for grade interpolation at Gibellini Hill. Hard contacts were maintained between oxidation domains – oxide blocks were estimated using oxide composites; transition blocks were estimated using transition composites; and reduced blocks were estimated using reduced composites. A range restriction of 110 feet was placed on grades greater than 1% V_2O_5 for each of the domains.

Ordinary kriging (OK) was used to estimate vanadium grade into mine blocks previously tagged as being within the 0.05% V_2O_5 grade domain solid. Two kriging passes were employed to interpolate blocks with vanadium grades.

AMEC interpolated blocks for grade that where outside of the grade shell using only composites external to the 0.05% V_2O_5 grade shell. These composites generally contain values of less than 0.05% V_2O_5. Mine block tabulation indicate that there were no oxide or transition blocks above the resource cut-off grades and only 2,645 Inferred tons of reduced material above a cut-off grade of 0.088% V_2O_5 averaging 0.120% V_2O_5 were interpolated.

No potential biases were noted in the model from the validations performed.

AMEC is of the opinion that continuity of geology and grade is adequately known for Measured and Indicated Resources for grade interpolation and mine planning. Classification of Inferred Resources required a composite within 300 feet from the block.

AMEC determined the extent of resources that might have reasonable expectation for economic extraction, as required by CIM (2003, 2010), by applying a Lerchs–Grossmann (LG) pit outline to the resources.

1.12.2 Louie Hill

Geological models were developed by American Vanadium geologists as a grade envelope that differentiated mineralized from unmineralized material.

Assays from Louie Hill were composited down-the-hole to 20 foot fixed lengths; no oxidation boundaries were interpreted, and the composite boundaries were treated as “hard” between mineralized and non-mineralized domains.

As no density measurements have been completed to date on mineralization from Louie Hill, the Gibellini Hill data were used in the Louie Hill estimate. No grade capping was employed for Louie Hill.

Variography, using correlograms, was performed to establish anisotropy ellipsoids and the nugget value.

Ordinary kriging (OK) was used to estimate V_20_5% grades into blocks domain tagged as mineralized and non-mineralized. A range restriction of 200 feet was placed on grades greater than 0.15% V_20_5, for blocks within the non-mineralized domain. Two kriging passes were employed to interpolate grades into the mineralized domain blocks. Blocks that contained both percentages of mineralized and non-mineralized material were weight averaged for a whole block V_20_5% grade.

No potential biases were noted in the model from the validations performed.

Because of the uncertainty in the drilling methods, sample preparation, assay methodology, and the slight grade bias of the Union Carbide's assays as compared to the American Vanadium assays, AMEC has limited the classification of resource blocks to the Inferred Resources category.

AMEC determined the extent of resources that might have reasonable expectation for economic extraction, as required by CIM (2003, 2010), by applying a Lerchs–Grossmann (LG) pit outline to the resources.

1.13 Mineral Resource Statement

Mineral Resources take into account geologic, mining, processing and economic constraints, and have been confined within appropriate LG pit shells, and therefore are classified in accordance with the 2010 CIM Definition Standards for Mineral Resources and Mineral Reserves.

Mr Edward J.C. Orbock III, an AMEC employee, and an SME Registered Member, is the Qualified Person (QP) for the Mineral Resource estimate for Gibellini Hill. Mineral Resources have an effective date of 31 July, 2011. The Mineral Resource estimate is inclusive of the Mineral Reserves.

Mr. Mark Hertel, P.Geo, an AMEC employee, and an SME Registered Member, is the QP for the Mineral Resource estimate for Louie Hill. Mineral Resources have an effective date of 20th May 2011.

Mineral Resources for Gibellini Hill are included as Table 1-1, whereas the Mineral Resources for Louie Hill are included as Table 1-2. Mineral Resources are stated using cut-off grades appropriate to the oxidation state of the mineralization.

Factors which may affect the conceptual pit shells used to constrain the mineral resources, and therefore the Mineral Resource estimates include commodity price assumptions, metallurgical recovery assumptions, pit slope angles used to constrain the estimates, assignment of oxidation state values, and assignment of SG values.

The Gibellini Hill resource model has a known error that has effectively reduced the overall grade for Measured and Indicated by approximately one percent. Adjustment to Atlas's transition assays between zero percent and 0.410% V_2O_5 were implemented twice. AMEC reran the model with the correction and the results indicate an approximate error of one percent. AMEC is of opinion that this error is not material to the estimate.

Table 1-1: Gibellini Hill Mineral Resource Estimate, Effective Date July 31, 2011, Edward J. C. Orbock III, SME Registered Member

Resource Class	Domain	Cut-off V_2O_5 (%)	Tons (Mt)	$V_2O_{5)}$ (%)	V_2O_5 Lbs. (Mlb)
Measured	Oxide	0.08	3.95	0.25	19.83
	Transition	0.07	3.95	0.38	29.88
Indicated	Oxide	0.08	8.01	0.22	35.05
	Transition	0.07	7.15	0.33	46.62
Total Measured and Indicated		various	23.05	0.29	131.37
Inferred	Oxide	0.08	0.16	0.20	0.98
	Transition	0.07	0.01	0.22	0.07
	Reduced	0.09	14.05	0.17	48.37
Total Inferred		various	14.23	0.17	49.42

Notes to Accompany Gibellini Hill Mineral Resources Table:

1. Mineral Resources are reported inclusive of Mineral Reserves
2. Mineral Resources are not Mineral Reserves until they have demonstrated economic viability
3. Mineral Resources are reported at various cut-off grades for oxide, transition, and reduced material
4. Mineral Resources are reported as undiluted
5. Mineral Resources are reported within a conceptual pit shell
6. Mineral Resources are reported using a long-term V_2O_5 price of US$12.59/lbs, mining and processing costs and variable recoveries that are based on the oxidation state in the deposit
7. Rounding as required by reporting guidelines may result in apparent summation differences between tons, grade and contained metal content
8. Tonnage and grade measurements are in US units. Grades are reported in percentages.

Table 1-2: Inferred Louie Hill Mineral Resource Estimate, Effective Date 20 May 2011, Mark Hertel, SME Registered Member

Cut-off V_20_5%	Tons (Mt)	V_20_5%	V_2O_5 (Mlb)
0.077	7.67	0.27	41.87

Notes to accompany Louie Hill Mineral Resource Table:

1. Mineral Resources are reported above a 0.077% V_20_5% cut-off grade
2. Mineral Resources are reported as undiluted
3. Mineral Resources are reported within a conceptual pit shell
4. Rounding as required by reporting guidelines may result in apparent summation differences between tons, grade and contained metal content
5. Tonnage and grade measurements are in US units. Grades are reported in percentages.

1.14 Mineral Reserve Estimation

Mineral Reserve estimates are based on Measured and Indicated Mineral Resources at Gibellini Hill. Because metallurgical test work does not support Measured and Indicated (MI) classification for reduced material, the reduced material was set to Inferred within the resource model. Inferred Mineral Resources were set to "waste". No Mineral Reserves have been estimated for Louie Hill.

AMEC applied dilution to the resource model to account for the ore-to-waste contact on a block by block basis. With the exception of edge dilution, no other dilution or losses were applied because the block size at 25 feet x 25 feet x 20 feet accounts for internal dilution and losses anticipated from mining activities.

Open pit mining optimization inputs for the Gibellini Project were based on an open pit bulk mining method assuming a three million ton per year throughput rate. Pit slopes used range from 31º to 42º. Open-pit contract mining costs were estimated at $2.34 per ton and Owner's costs were estimated at $0.26 per ton for a total mining cost of $2.60 per ton mined. Due to a longer ore haul than waste haul, the proportional unit rate mining cost for ore was estimated at $2.64 per ton and waste at $2.5 per ton. The total process cost utilized for pit optimization was $11.01 per ton leached.

1.15 Mineral Reserve Statement

Mineral Reserves have been modified from Mineral Resources by taking into account geologic, mining, processing, and economic parameters and therefore are classified in accordance with the 2010 CIM Definition Standards for Mineral Resources and Mineral Reserves.

The Qualified Person for the estimate is Kirk Hanson, P.E., an AMEC employee. Mineral Reserves have an effective date of 31 August 2011. Mineral Reserves are summarized in Table 1-3.

1.16 Mining Plan

AMEC designed a conventional open pit mine at Gibellini utilizing a truck and shovel fleet comprised of 100 ton trucks and front end loaders (FEL). Average mine production during the seven year mine life is 3.5 million tons of ore and waste per year. Mining is performed by contract with Gibellini mining staff overseeing the contract mine operation and performing the mine engineering and survey work.

Table 1-3: 2011 Gibellini Hill Mineral Reserve Estimate, Effective Date 31 August 2011, K. Hanson P.E.

Mineral Reserve Class	Oxidation State	Cut-off Grade (V_2O_5%)	Tonnage (Mt)	V_2O_5 (%)	V_2O_5 (Mlbs)
Proven	Oxide	0.15	3.77	0.26	19.46
	Transition	0.13	3.90	0.37	29.05
Probable	Oxide	0.15	5.83	0.25	29.42
	Transition	0.13	6.47	0.33	42.59
Total Proven and Probable	*varies*	*varies*	*19.97*	*0.30*	*120.52*

Notes to Accompany Mineral Reserves Table:

1. Mineral Reserves are contained within a pit created with the Lerchs-Grossmann (LG) algorithm completed at a $6.5 per pound V_2O_5 price. The optimization mining cost was $2.50/t mined. An average processing cost of $10.05 per ton was applied which included $8.90 per ton for processing, $0.54 per ton for rehandle, $0.47 per ton for pad replacement costs, and $0.14 per ton for an incremental ore haul cost. G&A and closure costs were applied at $0.67 per ton and $0.29 per ton processed respectively. Process recoveries varied by rock type. For oxide ore a 60 percent recovery was applied and for transition ore a 70 percent recovery was applied. A shipping and conversion cost of $0.374 per pound produced was also applied. Overall slope angles ranged from 32 degrees to 42 degrees
2. The life of mine strip ratio is 0.22:1 (waste:ore).
3. Rounding as required by reporting guidelines may result in apparent summation differences between tons, grade and contained metal content
4. Tonnage and grade measurements are in US units. Grades are reported in percentages.

Due to the relatively small size of the Gibellini mine operation and to increase productivity, a single shift schedule is planned to be operated at the mine. Crusher re-handle will be done on a continuous basis operating a two shift schedule, seven days per week for 24 hour per day coverage

The proposed pit limits of the oval-shaped pit will be approximately 2,275 feet by 1,650 feet in the north–south and east–west directions, respectively. The maximum excavation depth is anticipated to be approximately 180 feet. AMEC designed an ultimate pit inclusive of three internal phases. AMEC scheduled the phases to provide the highest valued ore to the leach pad in the early years. Additionally, the phases were scheduled to provide three million tons per year of ore to the leach pad while limiting bench advance to less than 10 benches per year.

The mine schedule is shown in Table 1-4.

Table 1-4: Mine Production Schedule

Period	Total	Rock Waste	Oxide Ore		Transition Ore		Total Ore		V_2O_5
	(kt)	(kt)	(kt)	(%V_2O_5)	(kt)	(%V_2O_5)	(kt)	(%V_2O_5)	(kbls)
Yr 1, Q1	639	52	588	0.23	—	—	588	0.23	2,684
Yr 1, Q2	790	40	750	0.25	0	0.14	750	0.25	3,799
Yr 1, Q3	810	60	723	0.26	27	0.46	750	0.27	4,046
Yr 1, Q4	815	65	626	0.27	124	0.46	750	0.31	4,586
Yr 2, Q1	812	62	322	0.29	428	0.47	750	0.39	5,897
Yr 2, Q2	782	32	306	0.31	444	0.45	750	0.39	5,879
Yr 2, Q3	809	59	204	0.29	546	0.41	750	0.38	5,660
Yr 2, Q4	883	133	678	0.28	72	0.47	750	0.30	4,474
Yr 3	3,501	501	1,772	0.26	1,228	0.37	3,000	0.31	18,310
Yr 4	3,181	181	1,808	0.24	1,192	0.36	3,000	0.29	17,374
Yr 5	3,760	760	729	0.26	2,271	0.36	3,000	0.33	20,062
Yr 6	4,155	1,155	822	0.21	2,178	0.28	3,000	0.26	15,542
Yr 7	3,331	1,200	273	0.21	1,859	0.30	2,131	0.29	12,202
Total	24,269	4,300	9,599	0.25	10,370	0.35	19,969	0.30	120,515

1.16.1 Process Plan

The processing method envisioned for Gibellini will be to feed ore from the mine via loader to a hopper that feeds the screening and crushing plant. The screen will send any material greater than a third-inch and less than four inches in size to the cone crusher (plus four inch material will be sent to stockpile for further treating).

The crushed material will recycle to the screen feed belt, thus crushing in closed circuit. The minus half-inch ore will be fed to the agglomerator where sulfuric acid, flocculent (agglomeration aid) and water will be added to achieve proper agglomeration. The agglomerated ore will be transported to a stacker on the leach pad, which will stack the ore to a height of 15 feet. Once the material is stacked and sufficient material accumulated to distribute sprinklers onto the leached material, solution will be added to the leach heap at a rate of 0.0025 gallons per minute per square foot. The solution will be collected in a pond and this pregnant leach solution (PLS) will be sent to the process building for metal recovery.

The PLS will be treated with iron to convert all of the vanadium in solution from the vanadate (VO_3^-) form to the vandyl (VO^{+2}) form, which will be preferentially loaded onto the organic phase in the extraction phase of treatment. Solvent extraction mixers-settlers will be used to recover the vanadium onto the organic phase and to produce a vanadium depleted aqueous solution (raffinate). The raffinate will then be returned to the leach pad to continue to leach the vanadium remaining in the heap material. The loaded organic phase from the extraction will then be contacted in a separate set of mixer-settlers called the strip circuit. Here the vanadium will be pulled from the organic phase into the new aqueous phase. The stripped organic will then be returned to the extraction circuit where it will be re-loaded with vanadium. The stripped vanadium solution will then be oxidized to vanadate with sodium chlorate and ammonia will be used to form ammonium metavanadate (AMV). Sulfuric acid will be added to the AMV and a precipitate will be formed. This precipitate will be settled in a thickener and the thickened material will be sent to a centrifuge. The thickener overflow will be recycled back to the strip circuit where it will be loaded with vanadium again.

Approximately 79.5 million pounds of V_2O_5 will be produced from Gibellini leaching operations at an average recovery of 66 percent.

Metal produced from leaching operations will generally increase from the first quarter of Year 1 to Year 5 as lower grade and lower recovery oxide ores are supplanted by higher grade and higher recovery transition ores. Following Year 5, the overall deposit grade drops; consequently, metal production likewise drops. The majority of the metal will be produced within the same reporting period as it is placed on the leach pad.

1.17 Leach Pad and Pond Design

The Gibellini Heap Leach Facility will leach minus half inch crushed and polymer agglomerated vanadium ore from the Gibellini Pit. The leach pad will be developed in two phases with the potential to expand to a third phase. Each phase, including the future expansion, is sized to accommodate approximately 10.0 million tons. The design concept for the leach pad liner system includes a composite lining system consisting of a geosynthetic clay liner (GCL) overlain by an 80 mil high-density polyethylene (HDPE) geomembrane liner.

The process pond system will be located to the east of the leach pad and consists of a PLS pond and a storm pond. Both the PLS pond and the storm pond are double lined with 80 mil HDPE geomembrane liner with an intermediate geonet drainage layer.

The facilities will be separated from the natural up gradient watersheds by storm water diversion systems designed to safely pass the 100-year, 24-hour precipitation event.

1.18 Mine Infrastructure

Infrastructure to support the Gibellini project consists of site civil work, site facilities/buildings, a water system, and site electrical. Site facilities include both mine facilities and process facilities. The mine facilities include the main office building, truck shop and warehouse, truck wash, fuel storage and distribution, and miscellaneous facilities. The process facilities include the process office building and assay laboratory and the product storage building. Both the mine facilities and the process facilities are serviced with potable water, fire water, power, propane, communication, and sanitary systems. Civil infrastructure includes roads, stormwater diversion and detention ponds, growth media stripping and stockpiling, and pad construction for the crusher and mine facilities.

1.19 Off-site Infrastructure

With the exception of road access, offsite infrastructure to support Gibellini operations is nonexistent. Because the Project relies on grid power and because a sustainable water source has not been identified on site, both offsite power and water are constructed to site.

The proposed 24.9 kilovolt distribution line route is approximately 27.2 miles from the utility connection point to the Gibellini Project. Site power will be supplied by Mt. Wheeler. The Mt. Wheeler Power transmission line will be terminated at a new substation on site.

Water will be supplied from wells located approximately 14 miles northeast of the mine site on the Don Hull ranch, and supplied via underground pipeline.

1.20 Market Studies

AMEC commissioned a market survey by the Roskill Consulting Group Ltd (Roskill) on behalf of American Vanadium to determine an appropriate vanadium price forecast for use in the Feasibility Study. As a result of the market survey, AMEC utilized Roskill's Real (US$2010) V_2O_5 price forecast to support Project economics. The realized selling price over the life of the project was $10.95 per pound of V_2O_5 sold.

1.21 Capital Cost Estimates

Capital cost estimates were based on a combination of design criteria, AMEC experience, and vendor quotes. The capital cost estimate for the Gibellini Vanadium Mine Feasibility Study Project was prepared as an AMEC Type 3 estimate, having 10 percent to 30 percent of full project definition. The Owner's costs are not included in this estimate. The estimate for AMEC's scope is considered to be at a feasibility level with an expected accuracy range of -10 percent to +15 percent, and includes contingency.

The total estimated cost to construct, install and commission the facilities described in this report is US $95.5 million. The estimate incorporates all direct field costs required to execute the project and the indirect costs associated with its design, construction, and commissioning. A summary overview of the estimate is shown in Table 1-5.

Table 1-5: Summary of Capital Costs

Cost Description	Total ($000s)
OPEN PIT MINE	
Open Pit Mine Development	1,285
Mobile Equipment	101
INFRASTRUCTURE-ON SITE	
Site Prep	2,213
Roads	1,266
Water Supply	1,827
Sanitary System	55
Electrical - On Site	1,867
Communications	150
Contact Water Ponds	158
Non-Process Facilities - Buildings	6,901
PROCESS FACILITIES	
Ore Handling	13,996
Heap Leach System	18,235
Process Plant	13,142
OFF-SITE INFRASTRUCTURE	
Water System	4,091
Electrical Supply System	2,936
First Fills	783
Total Direct Cost	69,007
Construction Indirect Costs	3,860
Sales Tax / OH&P	3,844
EPCM	8,058
Contingency	10,681
Total Project Cost	95,451

The base pricing is second quarter 2011 United States dollars. Further escalation is excluded from this study.

Due to the short mine life and contract mining, very little sustaining capital is required for the Gibellini Project. The most significant sustaining capital item is the 10 million ton, Phase II leach pad expansion in Year 3 (Table 1-6).

Table 1-6: Phase II Leach Pad Expansion Capital

Phase II Leach Pad Expansion	Total ($000s)
Total Direct Cost	6,733
Construction Indirect Costs	inc
Sales Tax / OH&P	inc
EPCM	inc
Contingency	808
Total Project Cost	7,541

1.22 Operating Cost Estimates

Operating costs were based on quotations for consumables, and wage rates determined from a 2010 labor survey for Northern Nevada.

Total mining costs, inclusive of both contract and owner's costs, is $2.42 per ton mined. Total process operating costs average $12.51 per ton leached. General and Administrative (G&A) costs average approximately $2.4 million per year and average $0.86 per ton leached.

Annual operating costs average approximately $48 million per year with the exception of Year 1 and Year 7, the start-up and decommission years respectively. Annual cost fluctuations during Year 2 through Year 6 are primarily the result of changes in the waste mining quantities. On a per-ton basis, the operating costs average $16.31 per ton leached.

1.23 Financial Analysis

The results of the economic analysis represent forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Forward-looking information includes Mineral Reserve estimates; commodity prices; the proposed mine production plan; projected recovery rates; use of a process method, that although well-known and proven on other deposit types, has not been previously brought into production for a vanadium project; infrastructure construction costs and schedule; and assumptions that Project environmental approval and permitting will be forthcoming from County, State and Federal authorities.

Financial analysis of the Gibellini project was carried out using a discounted cash flow (DCF) approach. This method of valuation requires projecting yearly cash inflows, or revenues, and subtracting yearly cash outflows such as operating costs, capital costs, royalties, and taxes. The resulting net annual cash flows are discounted back to the date of valuation and totalled to determine the net present value (NPV) of the project at selected discount rates. The internal rate of return (IRR) is expressed as the discount rate that yields an NPV of zero. The payback period is the time calculated from the start of production on 1/1/2013 until all initial capital expenditures have been recovered. This economic analysis includes sensitivities to variation in operating costs, capital costs, and metal price. It should be noted that, for the sake of discounting, cash flows are assumed to occur at the end of each period. All cash flows are discounted to the beginning of Q1 2012. Monetary values are in US dollars (US$).

Based on AMEC's financial evaluation, the Gibellini Project generates positive financial results. The pre-tax NPV at a seven percent discount rate (the base case rate) is $226.3 million and the IRR is 51 percent (Table 1-7). The after tax NPV at a seven percent discount rate is $170.1 million and the IRR is 43 percent (Table 1-8). Payback for the Project is estimated at 2.06 years and 2.38 years for the pre-tax and after tax scenarios respectively.

1.24 Sensitivity Analysis

A sensitivity analysis was completed over the ranges of ±30 percent for metal price (V_2O_5), operating costs, and capital costs. Note that sensitivity to grade and recovery are coincidental to metal price and follow the same trend. Based on the sensitivity work, the Gibellini Project is most sensitive to metal price followed by operating costs. The Project is least sensitive to capital costs.

1.25 Interpretation and Conclusions

Under the assumptions in the Feasibility Study, the Project has a positive economic outcome.

The major risks to the Project were considered to be marketing and permitting. Specifically, the permitting timeline was identified as aggressive in light of staffing difficulties at the permitting agencies, and the vanadium price is a risk due to the project's sensitivity to vanadium price. Note that vanadium price risk may be offset by potential value-add products such as battery electrolytes, which could potentially increase the product selling price by three- to four-fold.

Table 1-7: Summary Cash Flow Results, Pre-Tax (base case is highlighted)

Cash Flow Pre-Tax (000's)	$357,226
NPV @ 5%	$257,499
NPV @ 7%	$226,309
NPV @ 10%	$186,649
IRR Pre-Tax	51%
Payback - Years from Startup	2.06

Table 1-8: Summary of Cash Flow Results, After Tax (base case is highlighted)

Cash Flow After Tax (000's)	$275,719
NPV @ 5%	$195,216
NPV @ 7%	$170,071
NPV @ 10%	$138,131
IRR After Tax	43%
Payback - Years from Startup	2.38

1.26 Recommendations

AMEC has developed recommendations to help mitigate Project risks and provide a reasonable position on the Project for the American Vanadium Board to make a decision on mine development. The recommendations are envisaged as a single-stage program, with no area of work dependent on the results of another. Some aspects of the program are already underway. The estimated cost of the AMEC recommendations is about $1.13 million. The work program costs have been incorporated into the capital cost estimate for the project.

American Vanadium has advised AMEC that the engineering, procurement, and contract management contract, which is estimated to be about $8 million, has been awarded. American Vanadium may choose to undertake some of the recommended work program activities as part of the EPCM process.

2.0 INTRODUCTION

AMEC Americas Limited (AMEC) was commissioned by American Vanadium US Inc., a wholly-owned subsidiary of American Vanadium Corp. (American Vanadium) to prepare a technical report (the Report) on the results of a Feasibility Study completed on the wholly-owned Gibellini Vanadium Project (the Project), located within Eureka County, Nevada (Figure 2-1).

2.1 Terms of Reference

American Vanadium is using the Report in support of a press release dated 12 September 2011, entitled “American Vanadium Announces Positive Feasibility Study for Gibellini Vanadium Project”.

The Feasibility Study was completed in August, 2011. AMEC compiled the Feasibility Study, and acknowledges contributions from the following firms/entities in the areas indicated:

- Parr, Brown, Gee & Loveless: Mineral title opinion
- Roskill Information Services: Marketing study
- Hanlon Engineering Architecture inc: Offsite power supply and distribution
- Enviroscientists: Environmental permitting, socio-economic assessment, mine reclamation, and closure planning.

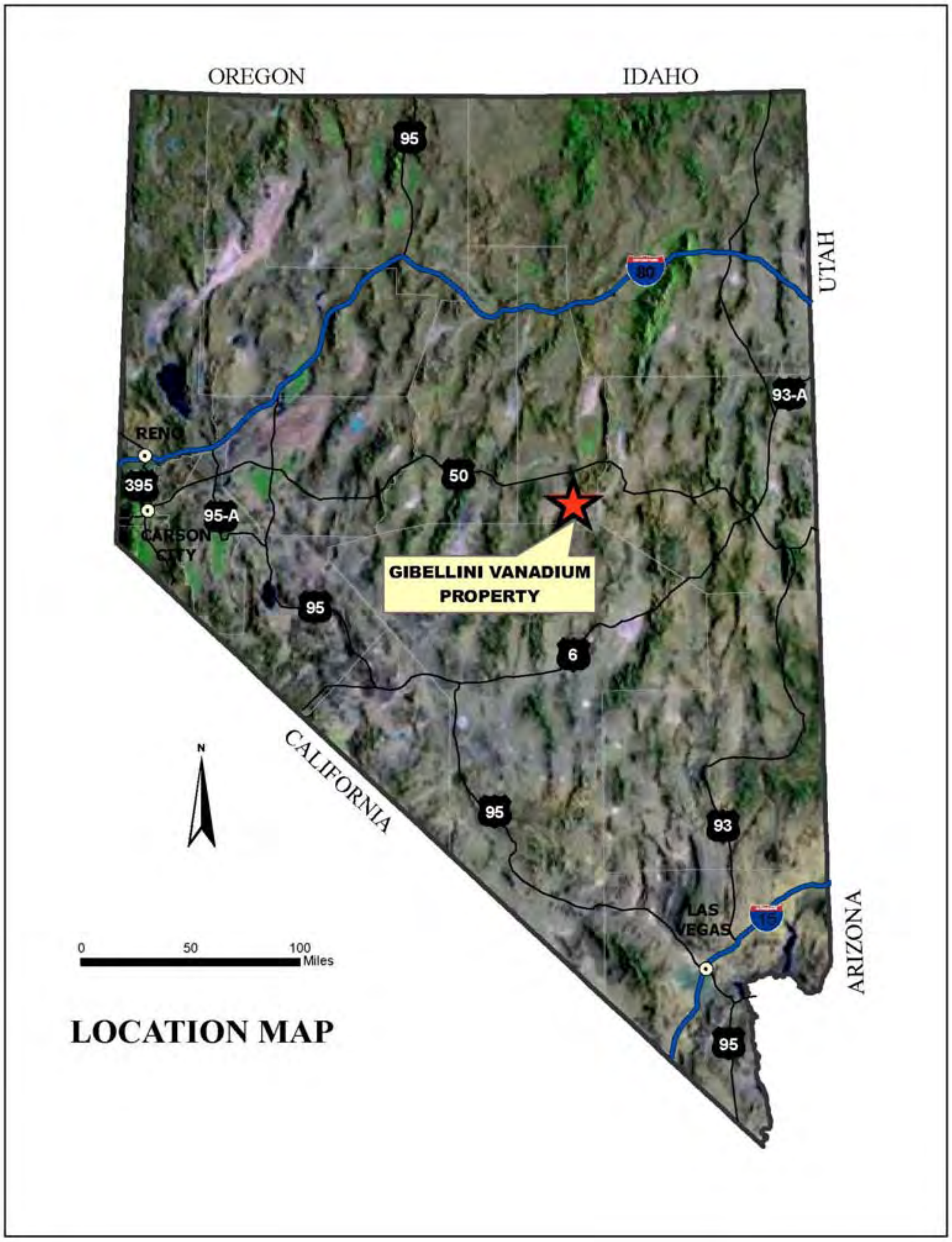
Unless specified, all measurements in this Report use the US English system. The report currency is expressed in US dollars.

2.2 Qualified Persons

The following people served as the Qualified Persons (QPs) as defined in National Instrument 43-101, *Standards of Disclosure for Mineral Projects*, and in compliance with Form 43-101F1:

- Kirk Hanson, P.E., MBA, Principal Mining Engineer, AMEC Reno
- Edward J.C. Orbock III, SME Registered Member, Principal Geologist, AMEC Reno
- Mark Hertel, SME Registered Member, Principal Geologist, AMEC, Phoenix
- Michael Drozd, SME Registered Member, Principal Metallurgist, AMEC Reno.

Figure 2-1: Project Location Plan



Note: Figure courtesy American Vanadium

2.3 Site Visits and Scope of Personal Inspections

QPs conducted site visits to the Project as shown in Table 2-1. During the site visits, the following scopes of personal inspection occurred.

Mr Orbock inspected surface geology, drill hole collars, diamond drilling, logging, and sampling protocols.

Mr Hanson reviewed sites amenable for locating potential infrastructure, in particular the proposed sites for the waste dump, heap leach pad and mine infrastructure from a mine engineering perspective. He also inspected the surface exposure of the area which will contain the proposed open pit.

Mr Drozd inspected drill core to provide a preliminary assessment of competency of the material down-hole as part of initial review for metallurgical crushing requirements. Mr Drozd also reviewed the sites of the proposed heap leach pad and process infrastructure from a process/metallurgical perspective.

2.4 Effective Dates

The Report has a number of effective dates, as follows:

- Effective date of the database closeout for Gibellini Hill for the purposes of estimation of Mineral Resources: 18 November 2010
- Effective date of the database closeout for Louie Hill for the purposes of estimation of Mineral Resources: 1 May, 2011
- Effective date of the Mineral Resources for Gibellini Hill: 31 July 2011
- Effective date of the Mineral Resources for Louie Hill: 20 May 2011
- Effective date of the Mineral Reserves: 31 August 2011
- Effective date of the tenure and surface rights data: 31 July 2011
- Effective date of the financial analysis: 31 August 2011.

Table 2-1: QPs, Areas of Report Responsibility, and Site Visits

Qualified Person	Site Visits	Report Sections of Responsibility (or Shared Responsibility)
Kirk Hanson	17 November 2010	Sections 1, 2, 3, 4, 5, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27.
Edward J.C. Orbock III	17 November 2010	Sections 6, 7, 8, 9, 10, 11, 12, and the portions of Section 14 that pertain to Mineral Resource estimation of the Gibellini Hill deposit (14.1, 14.3, 14.4 and 14.5), and those portions of the Summary, Interpretations and Conclusions and Recommendations that pertain to those Sections.
Mark Hertel	No site visit	That portion of Section 14 that pertains to Mineral Resource estimation of the Louie Hill deposit (14.2, 14.3, 14.4, and 14.5), and those portions of the Summary, Interpretations and Conclusions and Recommendations that pertain to those Sections.
Michael Drozd	17 November 2010	Sections 13 and 17, and those portions of the Summary, Interpretations and Conclusions and Recommendations that pertain to those Sections.

The overall effective date of the Report, based on the date of the Mineral Reserve estimate and supporting financial analysis is 31 August 2011.

At the Report effective date, metallurgical testwork was ongoing. An ongoing bench-scale column test is producing battery-grade electrolyte.

There has been no material change to the scientific and technical information on the Project between the effective date of the Report, and the signature date.

2.5 Information Sources and References

The primary data source for this Report is the Feasibility Study, entitled:

AMEC Americas Ltd, 2011: Gibellini Project Eureka County, Nevada, USA, Feasibility Study: unpublished report prepared by AMEC Americas for American Vanadium, dated 31 August 2011.

Reports and documents listed in the Section 3, Reliance on Other Experts and Section 27, References sections of this Report were also used to support preparation of the Report. Additional information was sought from American Vanadium personnel where required.

2.6 Previous Technical Reports

American Vanadium has not previously filed a technical report on the Project. A predecessor company to American Vanadium, RMP Resources Corporation filed the following technical reports:

Hanson, K., Wakefield T., Orbock, E., and Rust, J.C., 2010: Rocky Mountain Resources NI 43-101 Technical Report Gibellini Vanadium Project Nevada, USA: unpublished technical report prepared by AMEC E&C Services Inc. for RMP Resources Corporation, effective date 8 October 2008

Wakefield, T., and Orbock, E., 2007: 43-101 Technical Report Gibellini Property Eureka County, Nevada: unpublished technical report prepared by AMEC E&C Services Inc. for RMP Resources Corporation, effective date 18 April, 2007

3.0 RELIANCE ON OTHER EXPERTS

The QPs have relied upon and disclaim responsibility for information derived from the following reports pertaining to mineral tenure, surface rights, property agreements, permitting, social issues, taxation, marketing and environmental status.

3.1 Mineral Tenure and Royalties

The QPs have not reviewed the mineral tenure, nor independently verified the legal status, ownership of the Project area, underlying property agreements or permits. AMEC has fully relied upon, and disclaims responsibility for, information derived from legal experts for this information through the following documents:

Daniel A Jensen, 2011: Title Opinion, Gibellini Property, Eureka County, Nevada, Del Rio and Hot Creek Properties, Nye County, Nevada: confidential title opinion prepared by Parr Brown Gee & Loveless for American Vanadium Corp., Dundee Securities Ltd, Byron Capital Markets Ltd, Casimir Capital Ltd, 14 March 2011.

This information is used in Sections 4.3.1, 4.3.2, 4.3.3, 4.4.1, 4.4.2, and 4.4.3 of the Report.

Doyle, M., 2011: Gibellini Project: letter prepared by Michael Doyle as an officer of American Vanadium, addressed to Kirk Hanson, Project Manager, Gibellini Feasibility Study, dated 26 August 2011.

This information is used in Section 4.3 and Section 4.4 of the Report.

3.2 Surface and Water Rights

The QPs have fully relied upon and disclaim responsibility for information supplied by American Vanadium's staff and experts retained by American Vanadium for information relating to the status of the current Surface Rights as follows:

Doyle, M., 2011: Gibellini Project: letter prepared by Michael Doyle as an officer of American Vanadium, addressed to Kirk Hanson, Project Manager, Gibellini Feasibility Study, dated 26 August 2011.

This information is used in Section 4.5 and 4.6 of the Report.

3.3 Environmental, Permitting, and Social Issues

The QPs have fully relied upon and disclaim responsibility for information supplied by experts retained by American Vanadium for information relating to the environmental baseline status and environmental permitting for the Project as follows:

Environmental Scientists: Chapters 11 (Environmental & Permitting) and 12 (Closure Plan), Gibellini Feasibility Study: contribution chapters from Environmental Scientists, dated 23 August, 2011

This information is used in Section 20 of the Report.

3.4 Markets

The QPs have fully relied upon and disclaim responsibility for information supplied by experts retained by American Vanadium for information relating to the marketing for the Project as follows:

Roskill Consulting Group Ltd: AMEC Plc on behalf of American Vanadium, Market study on the current and forecast vanadium market: unpublished report prepared by Roskill for AMEC, dated 27 June 2011

This information is used in Section 19 of the Report

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Gibellini property is located in Eureka County, Nevada; about 25 miles south of the town of Eureka (see Figure 2-1). The Property is situated on the east flank of the Fish Creek Range in the Fish Creek Mining District and is accessed by dirt road extending westward from State Route 379.

The Property can be located on the USGS Summit Mountain 1:100,000 scale topographic map and the USGS Eightmile Well 1:24,000 scale, 7.5 minute series quadrangle map. It is centered at latitude 39° 13' North and longitude 116° 05' West. Mineralization at Gibellini is located within the southeast quadrant of Section 34 and the southwest quadrant of Section 35, Township 16 North, Range 52 East (T16N, R52E) Mount Diablo Base and Meridian (MDBM) and the northwest quadrant of Section 2 and the northeast quadrant of Section 3, Township 15 North, Range 52 East (T15N, R52E) MDBM.

During exploration on the Gibellini Project, American Vanadium has changed some deposit names. For the purposes of this Report, the name changes are:

- Gibellini vanadium deposit, Vanadium Hill deposit = Gibellini Hill vanadium deposit
- Bisoni vanadium prospect, Rich Hill vanadium prospect = Louie Hill vanadium deposit.

4.2 Property and Title in Nevada

Information in this sub-section has been compiled from Papke and Davis, (2002). The QPs have not verified this information, and have relied upon the Papke and Davis report, which is in the public domain for the data presented.

4.2.1 Mineral Title

Federal (30 USC and 43 CFR) and Nevada (NRS 517) laws concerning mining claims on Federal land are based on an 1872 Federal law titled "An Act to Promote the Development of Mineral Resources of the United States." Mining claim procedures still are based on this law, but the original scope of the law has been reduced by several legislative changes.

The Mineral Leasing Act of 1920 (30 USC Chapter 3A) provided for leasing of some non-metallic materials; and the Multiple Mineral Development Act of 1954 (30 USC Chapter 12) allowed simultaneous use of public land for mining under the mining laws and for lease operation under the mineral leasing laws. Additionally, the Multiple Surface Use Act of 1955 (30 USC 611-615) made "common variety" materials non-locatable; the Geothermal Steam Act of 1970 (30 USC Chapter 23) provided for leasing of geothermal resources; and the Federal Land Policy and Management Act of 1976 (the "BLM Organic Act," 43 USC Chapter 35) granted the Secretary of the Interior broad authority to manage public lands. Most details regarding procedures for locating claims on Federal lands have been left to individual states, providing that state laws do not conflict with Federal laws (30 USC 28; 43 CFR 3831.1).

Mineral deposits are located either by lode or placer claims (43 CFR 3840). The locator must decide whether a lode or placer claim should be used for a given material; the decision is not always easy but is critical. A lode claim is void if used to acquire a placer deposit, and a placer claim is void if used for a lode deposit. The 1872 Federal law requires a lode claim for "veins or lodes of quartz or other rock in place" (30 USC 26; 43 CFR 3841.1), and a placer claim for all "forms of deposit, excepting veins of quartz or other rock in place" (30 USC 35). The maximum size of a lode claim is 1,500 feet in length and 600 feet in width, whereas an individual or company can locate a placer claim as much as 20 acres in area.

Claims may be patented or unpatented. A patented claim is a lode or placer claim or mill site for which a patent has been issued by the Federal Government, whereas an unpatented claim means a lode or placer claim, tunnel right or mill site located under the Federal (30 USC) act, for which a patent has not been issued.

4.2.2 Surface Rights

About 85% of the land in Nevada is controlled by the Federal Government; most of this land is administered by the US Bureau of Land Management (BLM), the US Forest Service, the US Department of Energy, or the US Department of Defense. Much of the land controlled by the BLM and Forest Service is open to prospecting and claim location. The distribution of public lands in Nevada is shown on the BLM "Land Status Map of Nevada" (1990) at scales of 1:500,000 and 1:1,000,000.

Bureau of Land Management regulations regarding surface disturbance and reclamation require that a notice be submitted to the appropriate Field Office of the Bureau of Land Management for exploration activities in which five acres or fewer are proposed for disturbance (43 CFR 3809.1-1 through 3809.1-4). A Plan of Operations is needed for all mining and processing activities, plus all activities exceeding five acres of proposed disturbance. A Plan of Operations is also needed for any bulk sampling in which 1,000 or more tons of presumed ore are proposed for removal (43 CFR 3802.1 through 3802.6, 3809.1-4, 3809.1-5). The BLM also requires the posting of bonds for reclamation for any surface disturbance caused by more than casual use (43 CFR 3809.500 through 3809.560). The Forest Service has regulations regarding land disturbance in forest lands (36 CFR Subpart A). Both agencies also have regulations pertaining to land disturbance in proposed wilderness areas.

4.2.3 Environmental Regulations

All surface management activities, including reclamation, must comply with all pertinent Federal laws and regulations, and all applicable State environmental laws and regulations. The fundamental requirement, implemented in 43 CFR 3809, is that all hard rock mining under Plan of Operations or Notice on the public lands must prevent unnecessary or undue degradation. The Plan of Operations and any modifications to the approved Plan of Operations must meet the requirement to prevent unnecessary or undue degradation.

Authorization to allow the release of effluents into the environment must be in compliance with the Clean Water Act, Safe Drinking Water Act, Endangered Species Act, other applicable Federal and State environmental laws, consistent with BLM's multiple-use responsibilities under the Federal Land Policy and Management Act and fully reviewed in the appropriate National Environmental Policy Act (NEPA) document.

4.3 Mineral Tenure and Property Agreements

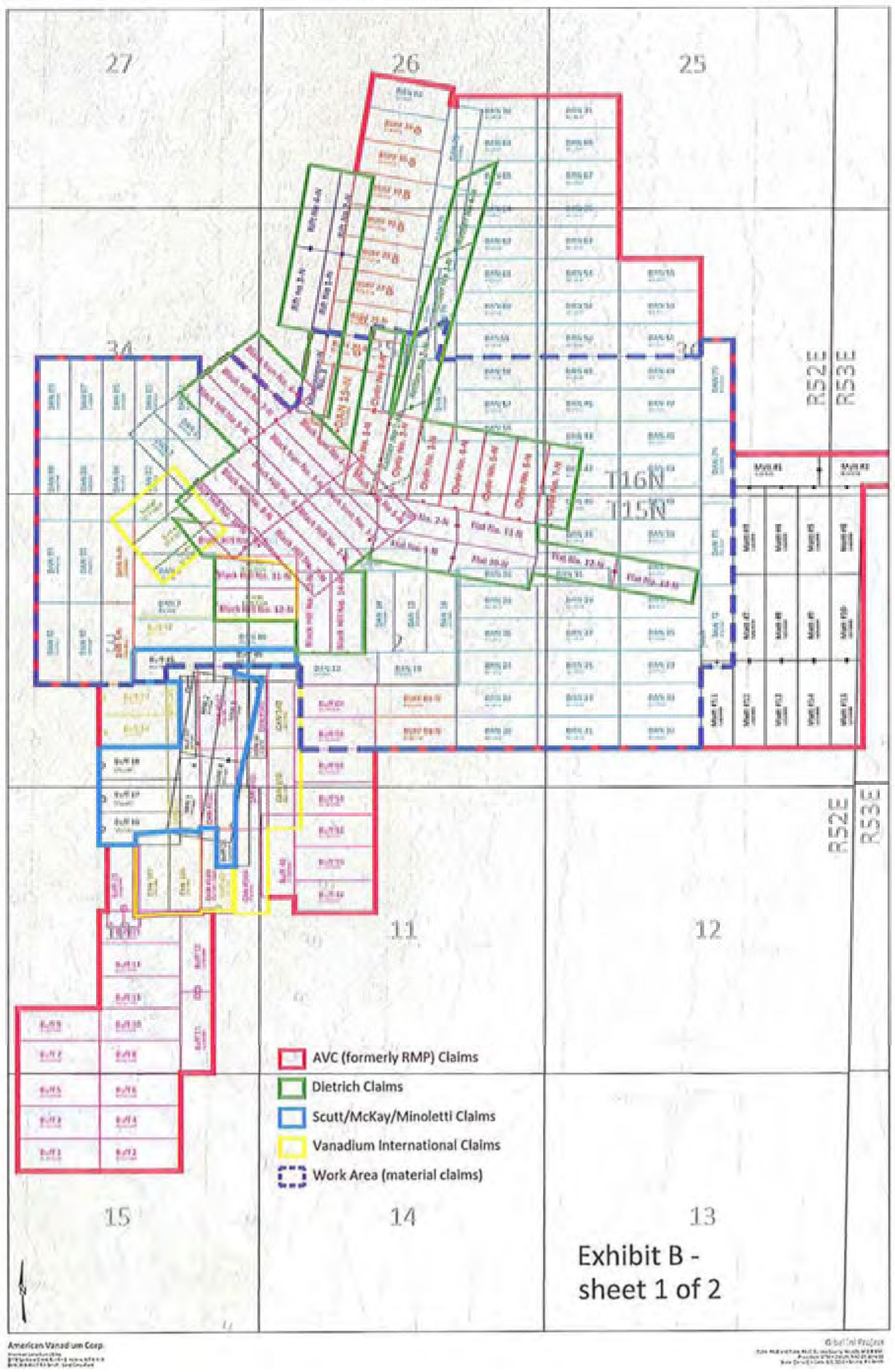
The Gibellini Project encompasses a total area of approximately 4,254 acres. The main ground holdings, surrounding the areas that have estimated Mineral Resources, are shown on Figure 4-1 and Figure 4-2.

The Project consists of seven placer claims and 232 unpatented lode mining claims, not all of which are contiguous. Claims are held in the names of a number of parties, with whom American Vanadium has agreements, and in the name of American Vanadium's predecessor company, Rocky Mountain Resources (RMP) and in the name of American Vanadium.

Unpatented mining claims are kept active through payment of a maintenance fee due by 1 September of each year. American Vanadium advised AMEC that payments for 2010 and 2011 were appropriately lodged.

There has been no legal survey of the Project claims. Under Nevada law, each unpatented claim is marked on the ground, and does not require survey.

Figure 4-1: Tenure Map, Western Portion



Note: AVC = American Vanadium, RMP = Rocky Mountain Resources. Figure courtesy American Vanadium

Figure 4-2: Tenure Map, Eastern Portion

Note: AVC = American Vanadium, RMP = Rocky Mountain Resources. Figure courtesy American Vanadium

4.3.1 Dietrich Leases (formerly the Gibellini Property Lease)

RMP signed a mineral lease agreement on 13 March 2006 for a 100 percent interest in 40 claims (Black Hill, Black Iron, Flat, Manganese, Rattler, Rift, and Clyde series), covering portions of Sections 26, 34, 35, and 36 T16N, R52E and portions of Sections 1, 2 and 3, T15N, R52E MDM in Eureka County from the registered owners Janelle Dietrich, Kenneth Campbell, and Jacqualeene Campbell. Kenneth Campbell and Jacqualeene Campbell subsequently assigned their interests in the lease and conveyed their interests in the leased claims to Janelle Dietrich, leaving Janelle Dietrich as the lessor and RMP/American Vanadium as the lessee.

Because of concerns that arose during the course of the mineral title opinion review in support of this Report that some of the leased claims might have become void because of failure to properly comply with annual claim maintenance filing requirements, the claims covered by the Dietrich Lease were formally abandoned by Janelle Dietrich and the ground within those claims was restaked with new claims listing Janelle Dietrich as the owner.

Janelle Dietrich and American Vanadium then, on March 2, 2011, executed and recorded a ratification of the Dietrich Lease, affirming the continued existence and good standing of the Dietrich Lease and acknowledging that the Dietrich Lease now covers the relocated Dietrich Claims.

The initial agreement stated that no conflicts exist with claims owned by other parties with the possible exception of the Black Hills number 11 and 12 claims (see Section 4.3.3).

Table 4-1 shows the 40 unpatented lode mining claims that comprise the Dietrich Lease.

4.3.2 MSM Claims (formerly the Van Lease Claims)

RMP signed a mineral lease agreement and option to purchase on 30 December 2006 for a 100 percent interest in four claims (Van 1–4), covering portions of Sections 2, 3, and 10 T15N, R52E MDM in Eureka County from the registered owners Pamela S. Scutt, Richard McKay, and Nancy Minoletti.

In October–November 2007, as part of a mineral survey to ascertain validity of selected Vanadium International Corp. claims, (see Section 4.3.3) it was discovered that the Van 1–4 claims had become invalid on a date after location. These claims were not previously known to be of questionable validity.

Table 4-1: Dietrich Lease Claims

BLM Serial Number	Claim Name	First Page (MR, Township, Range, Section)
NMC82892	Black Hill # 1-N	21 0150N 0520E 002
NMC82893	Black Hill # 2-N	21 0160N 0520E 034
NMC82894	Black Hill # 3-N	21 0160N 0520E 034
NMC82895	Black Hill # 4-N	21 0150N 0520E 002
NMC82896	Black Hill # 7-N	21 0150N 0520E 002
NMC82897	Black Hill # 8-N	21 0150N 0520E 002
NMC82898	Black Hill # 9-N	21 0150N 0520E 002
NMC82899	Black Hill # 10-N	21 0150N 0520E 003
NMC793247	Black Hill 11-N	21 0150N 0520E 002
NMC793248	Black Hill 12-N	21 0150N 0520E 002
NMC793249	Black Hill 13-N	21 0150N 0520E 002
NMC793250	Black Hill 14-N	21 0150N 0520E 002
NMC82900	Black Iron # 1-N	21 0150N 0520E 002
NMC82901	Black Iron # 3-N	21 0160N 0520E 034
NMC82902	Black Iron # 4-N	21 0150N 0520E 002
NMC82903	Black Iron # 5-N	21 0150N 0520E 002
NMC82904	Black Iron # 6-N	21 0160N 0520E 034
NMC82921	Clyde # 1-N	21 0150N 0520E 002
NMC82922	Clyde # 2-N	21 0160N 0520E 035
NMC82923	Clyde # 3-N	21 0160N 0520E 035
NMC82924	Clyde # 4-N	21 0160N 0520E 035
NMC82925	Clyde # 5-N	21 0160N 0520E 035
NMC82926	Clyde # 6-N	21 0160N 0520E 035
NMC82927	Clyde # 7-N	21 0150N 0520E 001
NMC82928	Clyde # 8-N	21 0160N 0520E 035
NMC82905	Flat # 1-N	21 0150N 0520E 002
NMC82906	Flat # 2-N	21 0150N 0520E 002
NMC82908	Flat # 10-N	21 0150N 0520E 002
NMC82909	Flat # 11-N	21 0150N 0520E 002
NMC82910	Flat # 12-N	21 0150N 0520E 001
NMC82911	Flat # 13-N	21 0150N 0520E 001
NMC82912	Manganese # 3-N	21 0160N 0520E 035
NMC82913	Rattler # 1-N	21 0160N 0520E 035
NMC82914	Rattler # 2-N	21 0160N 0520E 035
NMC82915	Rattler # 3-N	21 0160N 0520E 035
NMC82916	Rattler # 4-N	21 0160N 0520E 026
NMC82917	Rift # 1-N	21 0160N 0520E 035
NMC82918	Rift # 2-N	21 0160N 0520E 026
NMC82919	Rift # 3-N	21 0160N 0520E 035
NMC82920	Rift # 4-N	21 0160N 0520E 026

In accordance with the terms of the lease agreement, RMP relocated the claims as Van 1–4 and Van 3A, and deeded Buff 16-18, Buff 22, Buff 43, and Buff 45–46 to the lease holders in order to provide them with the same ground previously embraced by the original Van 1–4 claims.

Table 4-2 presents the 12 unpatented lode claims in the MSM Lease area. In previous technical reports, these claims have been referred to as the Van Lease Claims; however, this usage has been discontinued as the agreements cover additional claims than just the Van claims.

4.3.3 Vanadium International Corp. Lease

In April 2007, RMP leased 17 unpatented mining claims from Mr. Dennis LaPrairie, President of, and agent for, Vanadium International Corporation, a private Nevada Corporation, with offices in Reno, Nevada. The claims (Can, Sand, and Van 5 to 6 series) cover portions of Sections 2, 3, 10, and 11, T15N, R52E, and portions of Section 34 T16N, R52E MDM in Eureka County, Nevada.

An initial payment of $10,000 secured the lease for the first year. Advance royalty payments of $10,000 in years two and three and $15,000 per year thereafter and payments of the annual assessment filing fees keep the lease active for 10 years. The lease is renewable after the first 10 years.

During the title opinion search in support of this Report, it was noted that for claims CAN #141, #142, #151, #152, #164 and #165, there is a recorded chain of title into U.S. Vanadium Corp. (a Nevada corporation), which later changed its corporate name to Vanadium International, Inc. followed by another name change to Vectoria Inc. and then a series of name changes ending in Affinity Networks Inc. Record title to the six CAN claims remains in U.S. Vanadium Corp. (now known as Affinity Networks Inc.). During title search, no record can be found that conveyed the claims from from Vectoria Inc to Vanadium International Corp., and thus there is no record of a lease on these claims to American Vanadium.

RMP noted that upon signing of the Vanadium International Corporation lease, there were validity questions in regards to overlap of more senior claims for CAN #142–143, CAN #152–153, and CAN #164–166, which were staked after the VAN 1–4 claims that comprise the MSM or Van Lease claims. A mineral surveyor has determined that the CAN #142–143, CAN #152–153, and CAN #165 claims are invalid.

Table 4-2: Van Lease Claims (Pamela S. Scutt, Richard McKay, and Nancy Minoletti)

BLM Serial Number	Claim Name	County Book	Page Number	First Page (MR, Township, Range, Section)
NMC968757	VAN 1	466	182	21 0150N 0520E 010
NMC968758	VAN 2	466	183	21 0150N 0520E 003
NMC968759	VAN 3	466	184	21 0150N 0520E 002
NMC969607	VAN 3A	467	21	21 0150N 0520E 002
NMC968760	VAN 4	466	185	21 0150N 0520E 010
NMC954492	BUFF 16	458	119	21 0150N 0520E 010
NMC954493	BUFF 17	458	120	21 0150N 0520E 003
NMC954494	BUFF 18	458	121	21 0150N 0520E 003
NMC954498	BUFF 22	458	125	21 0150N 0520E 002
NMC954500	BUFF 43	458	127	21 0150N 0520E 003
NMC954502	BUFF 45	458	129	21 0150N 0520E 003
NMC954503	BUFF 46	458	130	21 0150N 0520E 002

The remaining claims, CAN 140, 143, 150, 153, 166 and 167, SAND 1, 2 and 6, and VAN 5 and 6 have a recorded chain of title that consists of the initial location certificates in the name of Medan Management Corp., followed by conveyances to U.S. Vanadium Corp., a Nevada corporation, that later changed its corporate name to Vanadium International, Inc. and then to Vectoria Inc., and finally a conveyance to Vanadium International Corp., which leased the claims to American Vanadium.

The VAN 5 and VAN 6 claims exactly overly two of the Black Hills 11 and 12 claims held under the Dietrich Lease and are considered by RMP to be senior to the two Black Hills claims based upon date of location

Table 4-3 includes the 17 unpatented lode claims held by Vanadium International Corporation.

4.3.4 American Vanadium Lode Claims

Table 4-4 presents the claims that are 100 percent-owned by American Vanadium through RMP. These 146 unpatented lode mining claims are located within Sections 1, 2, 3, 10, 11 and 15, Tl5N, R52E, Sections 25, 26, 34, 35 and 36, Tl6N, R52E, Section 6, Tl5N, R532E, and Sections 28, 31 and 32, Tl6N, R532E, MDM, Eureka County.

Claim LSV#2 is covered by a federal oil and gas lease, BLM serial No. N83750, covering Section 32, TI6N,R53E.

Table 4-3: Vanadium International Corporation Claims (Dennis LaPrairie as agent)

BLM Serial Number	Claim Name	County Book	Page Number	First Page (MR, Township, Range, Section)
NMC728088	CAN #141	160	296	21 0150N 0520E 003
NMC728089	CAN #142	160	297	21 0150N 0520E 003
NMC728092	CAN #151	160	300	21 0150N 0520E 003
NMC728093	CAN #152	160	301	21 0150N 0520E 003
NMC728095	CAN #164	160	303	21 0150N 0520E 010
NMC728096	CAN #165	160	304	21 0150N 0520E 010
NMC797097	CAN 140	171	94	21 0150N 0520E 003
NMC797098	CAN 143	171	94	21 0150N 0520E 003
NMC797099	CAN 150	171	95	21 0150N 0520E 003
NMC797100	CAN 153	171	96	21 0150N 0520E 003
NMC797101	CAN 166	171	97	21 0150N 0520E 003
NMC797102	CAN 167	171	98	21 0150N 0520E 003
NMC797103	SAND 1	171	99	21 0150N 0520E 003
NMC797104	SAND 2	171	100	21 0150N 0520E 003
NMC797105	SAND 6	171	101	21 0150N 0520E 003
NMC797106	VAN 5	171	102	21 0150N 0520E 002
NMC797107	VAN 6	171	103	21 0150N 0520E 002

Table 4-4: American Vanadium Lode Claims

BLM Serial Number	Claim Name	County Book	Page Number
NMC926064	DAN 2	436	128
NMC926065	DAN 3	436	129
NMC926068	DAN 6	436	132
NMC926069	DAN 7	436	133
NMC926072	DAN 10	436	136
NMC926074	DAN 12	436	138
NMC926075	DAN 13	436	139
NMC926076	DAN 14	436	140
NMC926077	DAN 15	436	141
NMC926078	DAN 16	436	142
NMC926079	DAN 17	436	143
NMC926080	DAN 18	436	144
NMC954495	BUFF 19	458	122
NMC954496	BUFF 20	458	123
NMC954499	BUFF 41	458	126
NMC954504	BUFF 47	458	131
NMC954477	BUFF 1	458	104
NMC954478	BUFF 2	458	105
NMC954479	BUFF 3	458	106
NMC954480	BUFF 4	458	107
NMC954481	BUFF 5	458	108

BLM Serial Number	Claim Name	County Book	Page Number
NMC954482	BUFF 6	458	109
NMC954483	BUFF 7	458	110
NMC954484	BUFF 8	458	111
NMC954485	BUFF 9	458	112
NMC954486	BUFF 10	458	113
NMC954487	BUFF 11	458	114
NMC954488	BUFF 12	458	115
NMC954489	BUFF 13	458	116
NMC954490	BUFF 14	458	117
NMC954491	BUFF 15	458	118
NMC954497	BUFF 21	458	124
NMC975406	BUFF 40	468	111
NMC975407	BUFF 42	468	112
NMC975409	BUFF 50	468	114
NMC975411	BUFF 52	468	116
NMC975413	BUFF 54	468	118
NMC975415	BUFF 56	468	120
NMC975418	BUFF 58	468	123
NMC975419	BUFF 60	468	124
NMCI031287	DAN 20	510	224
NMCI031288	DAN 21	510	225
NMCI031289	DAN 22	510	226
NMCI031290	DAN 23	510	227
NMCI031291	DAN 24	510	228
NMCI031292	DAN 25	510	229
NMCI031293	DAN 26	510	230
NMCI031294	DAN 27	510	231
NMCI031295	DAN 28	510	232
NMCI031296	DAN 29	510	233
NMCI031297	DAN 30	510	234
NMCI031298	DAN 31	510	235
NMCI031299	DAN 32	510	236
NMCI031300	DAN 33	510	237
NMCI031301	DAN 34	510	238
NMCI031302	DAN 35	510	239
NMCI031303	DAN 36	510	240
NMCI031304	DAN 37	510	241
NMCI031305	DAN 38	510	242
NMCI031306	DAN 39	510	243
NMCI031307	DAN 40	510	244
NMCI031308	DAN 41	510	245
NMCI031309	DAN 42	510	246
NMCI031310	DAN 43	510	247
NMCI031311	DAN 44	510	248
NMCI031312	DAN 45	510	249

BLM Serial Number	Claim Name	County Book	Page Number
NMCI031313	DAN 46	510	250
NMCI031314	DAN 47	510	251
NMCI031315	DAN 48	510	252
NMCI031316	DAN 49	510	253
NMCI031317	DAN 50	510	254
NMCI031318	DAN 51	510	255
NMCI031319	DAN 52	510	256
NMCI031320	DAN 53	510	257
NMC1031321	DAN 54	510	258
NMCI031322	DAN 55	510	259
NMCI031323	DAN 56	510	260
NMCI031324	DAN 57	510	261
NMCI031325	DAN 58	510	262
NMCI031326	DAN 59	510	263
NMCI031327	DAN 60	510	264
NMCI031328	DAN 61	510	265
NMC1031329	DAN 62	510	266
NMCI031330	DAN 63	510	267
NMCI031331	DAN 64	510	268
NMCI031332	DAN 65	510	269
NMCI031333	DAN 66	510	270
NMCI031334	DAN 67	510	271
NMCI031335	DAN 68	510	272
NMCI031336	DAN 69	510	273
NMCI031337	DAN 70	510	274
NMCI031338	DAN 71	510	275
NMCI031339	DAN 72	510	276
NMCI031340	DAN 73	510	277
NMCI031341	DAN 74	510	278
NMC1031342	DAN 75	510	279
NMCI031343	DAN 76	510	280
NMCI031344	DAN 77	510	281
NMCI031345	DAN 78	510	282
NMCI031346	DAN 79	510	283
NMCI031347	DAN 80	510	284
NMCI031348	DAN 81	510	285
NMCI031349	DAN 82	510	286
NMCI031350	DAN 83	510	287
NMCI031351	DAN 84	510	288
NMCI031352	DAN 85	510	289
NMCI031353	DAN 86	510	290
NMCI031354	DAN 87	510	291
NMCI031355	DAN 88	510	292
NMCI031356	DAN 89	510	293
NMC1031357	DAN 90	510	294

BLM Serial Number	Claim Name	County Book	Page Number
NMC1031358	DAN 91	510	295
NMCI031359	DAN 92	510	296
NMCI031360	DAN 93	510	297
NMCI031361	DAN 94	510	298
NMCI036004	LSV#1	511	335
NMCI036005	LSV#2	511	336
NMCI036006	MATT #1	511	337
NMCI036007	MATT #2	511	338
NMCI036008	MATT #3	511	339
NMCI036009	MATT #4	511	340
NMCI036010	MATT #5	511	341
NMCI036011	MATT #6	511	342
NMCI036012	MATT #7	511	343
NMCI036013	MATT #8	511	344
NMCI036014	MATT #9	511	345
NMCI036015	MATT #10	511	346
NMC1036016	MATT #11	511	347
NMCI036017	MATT #12	511	348
NMCI036018	MATT #13	511	349
NMCI036019	MATT #14	511	350
NMCI036020	MATT #15	511	351
NMC926066	DAN 4-N	436	130
NMC926067	DAN 5-N	436	131
NMC926081	DAN 19-N	436	145
NMCI038887	DAN 95-N	512	360
NMC956620	BUFF 23-N	458	381
NMC956622	BUFF 25-N	458	383
NMC956624	BUFF 27-N	458	385
NMC956626	BUFF 29-N	458	387
NMC956628	BUFF 31-N	458	389
NMC956630	BUFF 33-N	458	391
NMC956632	BUFF 35-N	458	393
NMC956633	BUFF 36-N	458	394
NMC975416	BUFF 59-N	468	121
NMC975420	BUFF 61-N	468	125

4.3.5 American Vanadium Lode and Placer Claims

After the legal opinion supporting the Project tenure covered under agreements was provided to AMEC, American Vanadium acquired additional placer claims in April 2011.

American Vanadium provided the information that is summarized in Table 4-5.

Table 4-5: American Vanadium Lode and Placer Claims Acquired April 2011

BLM Serial Number	Claim Name	County Book	Page Number
NMC1047943	Flow 1	517	233
NMC1047944	Flow 2	517	234
NMC1047945	Flow 3	517	235
NMC1047946	Flow 4	517	236
NMC1047947	Flow 5	517	237
NMC1047948	Flow 6	517	238
NMC1047949	Haul 1	517	239
NMC1047950	Haul 2	517	240
NMC1047951	Haul 3	517	241
NMC1047952	Haul 4	517	242
NMC1049221	Dry 1 *	518	270
NMC1049222	Dry 2 *	518	271
NMC1049223	Dry 3 *	518	272
NMC1049224	Dry 4 *	518	273
NMC1049225	Dry 5 *	518	274
NMC1049226	Dry 6 *	518	275
NMC1049227	Dry 7 *	518	276
NMC1042070	Rhyolite 10	514	55
NMC1040269	Rhyolite 11	514	56
NMC1042071	Rhyolite 15	514	57
NMC1042072	Rhyolite 16	514	58
NMC1042073	Jct. No. 1	514	59
NMC1042074	Jct. No. 2	514	60
NMC1042075	Jct. No. 3	514	61

Note: * indicates placer claims

Claim locations for the proposed rhyolite borrow source are shown in Figure 4-3 (the "Dry" claims) and Figure 4-4 (the "Rhyolite" claims). Figure 4-5 shows the locations of the "Flow" placer claims, and Figure 4-6 shows the locations of the "Haul" claims. The Junction claims location is indicated in Figure 4-7.

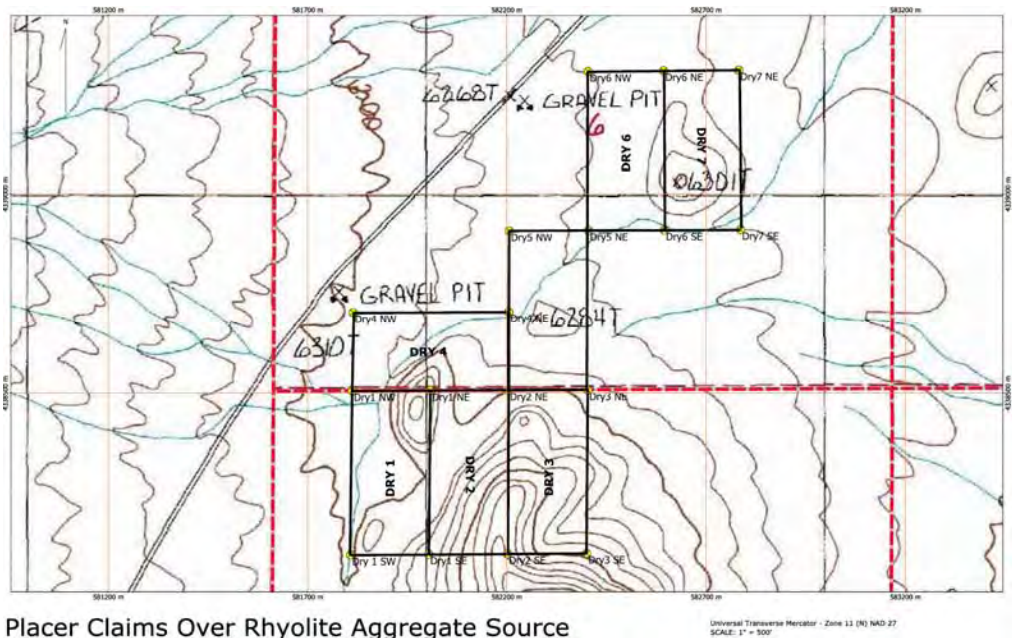
4.4 Royalties

4.4.1 Dietrich Lease

As advance royalties, RMP paid $60,000 upon execution of the agreement and RMP/American Vanadium will pay $30,000 for each calendar quarter thereafter until RMP begins payment of production royalties or terminates the lease agreement.

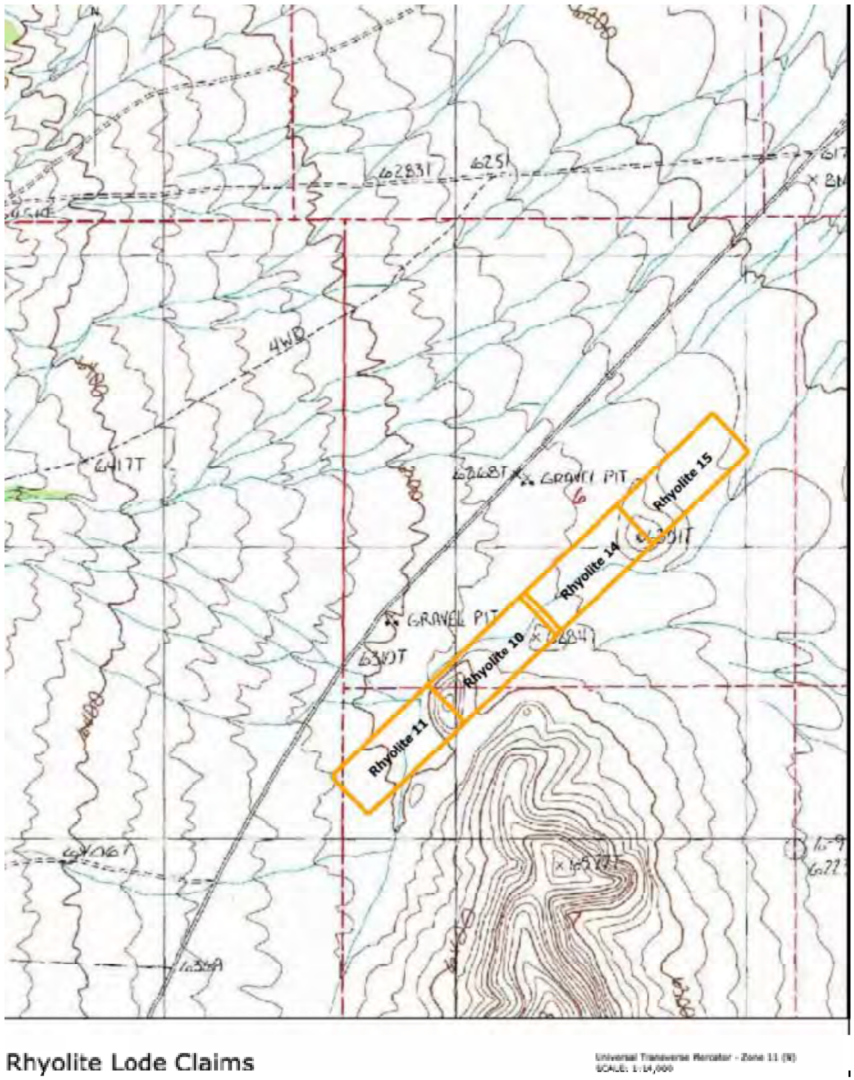
Advance royalties are deductible cumulatively as a credit against production royalties. RMP will pay a production royalty of 2.5 percent of the net smelter returns (NSR) until royalty payments reach a total of $3 million, where the royalty decreases to 2.0 percent. In later sections of the Report, this is referred to as the "Dietrich Royalty".

Figure 4-3: Dry Claims Location Map



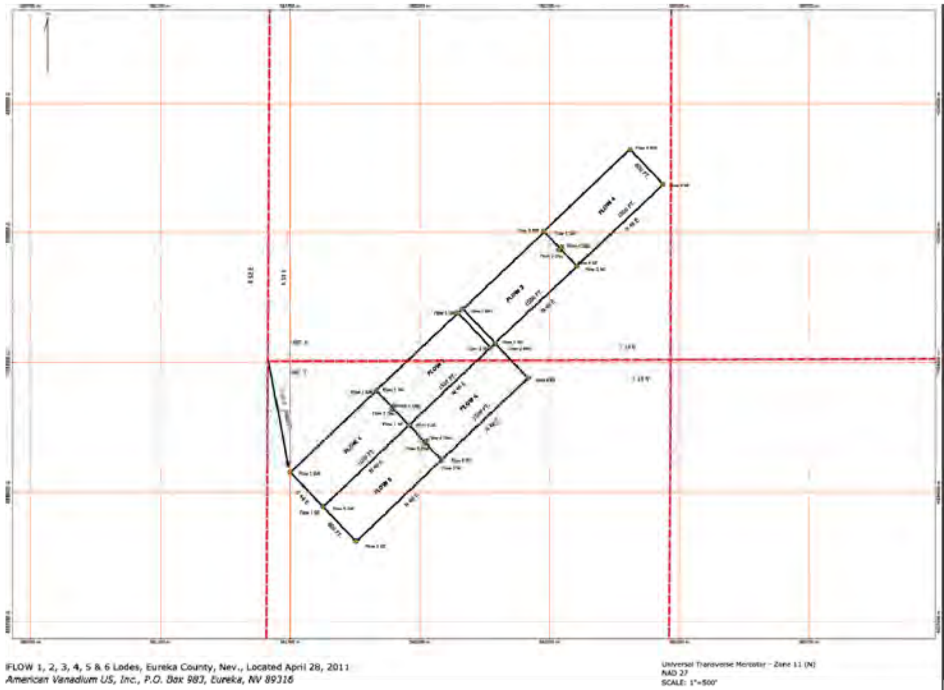
Note: Figure courtesy American Vanadium. Map north is to top of plan. Scale as indicated.

Figure 4-4: Rhyolite Claims Location Map



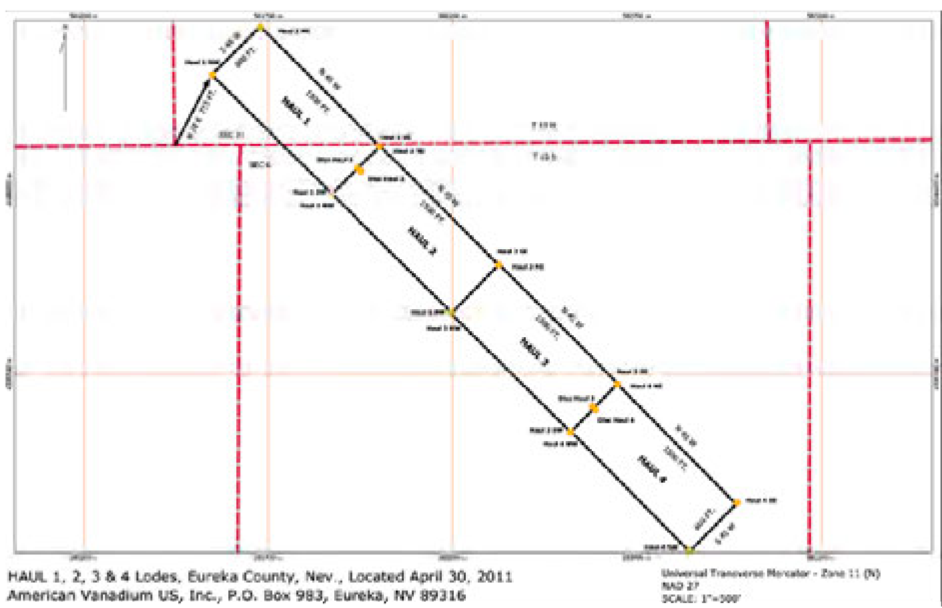
Note: Figure courtesy American Vanadium. Map north is to top of plan. Scale as indicated.

Figure 4-5: Flow Claims Location Map



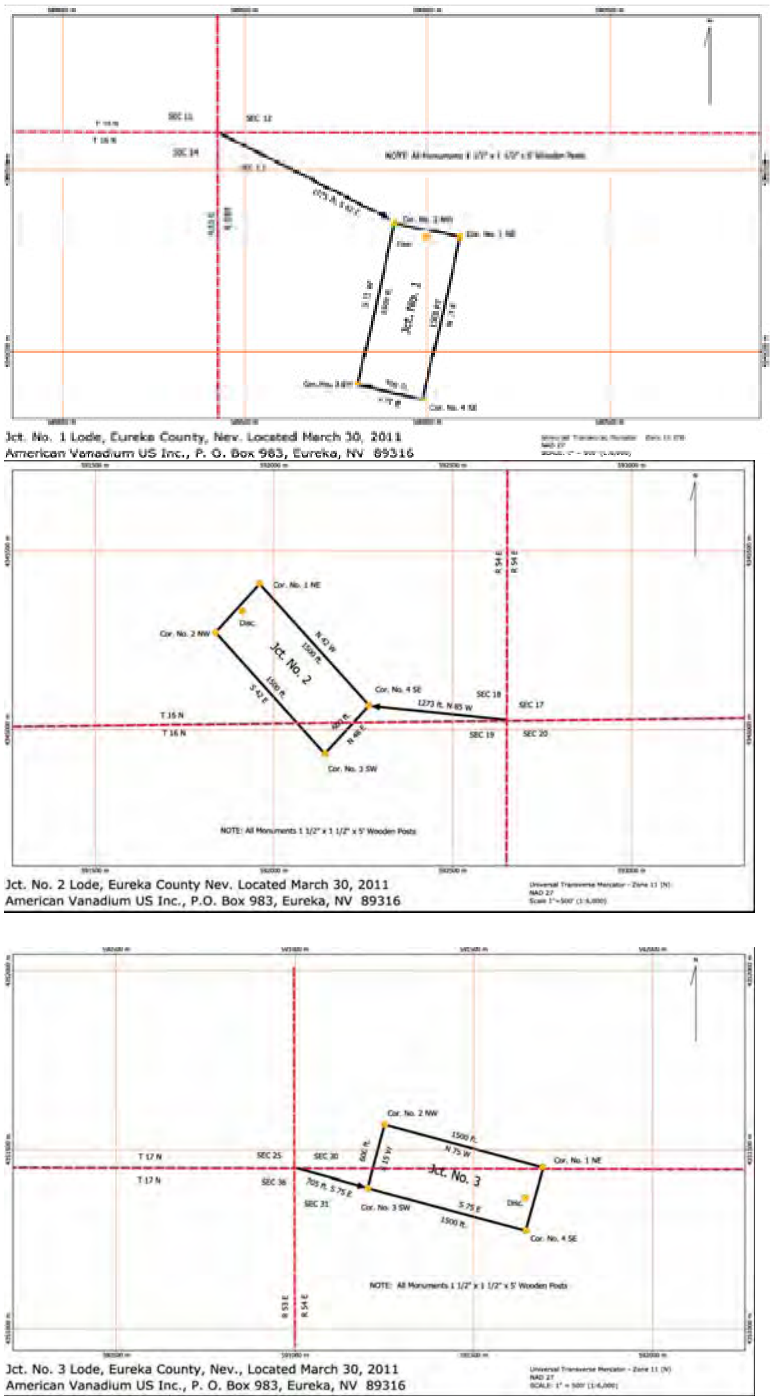
Note: Figure courtesy American Vanadium

Figure 4-6: Haul Claims Location Map



Note: Figure courtesy American Vanadium

Figure 4-7: Junction Claims Location Map



Note: Figures courtesy American Vanadium

4.4.2 MSM Claims

As advance royalties, RMP paid $9,000 upon execution of the agreement and will pay $12,000 for year two of the agreement, $15,000 for year three, $20,000 for year four, and $24,000 for each year thereafter until RMP begins payment of production royalties or terminates the lease agreement.

Advance royalties are deductible cumulatively as a credit against production royalties and will be credited toward the purchase price of $1,000,000. RMP will pay an initial production royalty payment of $30,000 within 60 days of production from the claims and will pay a production royalty of 3.0 percent of the net smelter returns. These payments will be credited toward the purchase price.

4.4.3 Vanadium International Corp. Lease

An initial payment of $10,000 secured the lease for the first year. Advance royalty payments of $10,000 in years two and three and $15,000 per year thereafter and payments of the annual assessment filing fees keep the lease active for 10 years.

Advance royalties are deductible cumulatively as a credit against production royalties and shall be credited toward the purchase price of $600,000. RMP will pay a production royalty of 2.5 percent of the net smelter returns until royalty payments reach a total of $1 million, then the royalty is dropped.

4.5 Surface Rights

The Gibellini Project is situated entirely on public lands that are administered by the Bureau of Land Management (BLM). No easements or rights of way are required for access over public lands.

American Vanadium expects that the proposed water pipeline (see Section 4.6 and Section 18.3) will use the same right-of-way as the proposed powerline (see Section 18.3). This right-of-way would be applied for, and held in the name of, Mt Wheeler Power.

4.6 Water Rights

Water will be supplied to the proposed mine via a buried conveyance pipeline from the Don Hull ranch located approximately 14 miles northeast of the planned mine site. Water will be pumped from two existing wells at a rate of 250 gallons per minute each.

4.7 Permits

Current exploration activities are covered by an Exploration Notice that has been submitted to the BLM. To date, less than 10 acres of area have been disturbed, an area of disturbance permitted under the Exploration Notice.

Permits required to support Project development are discussed in Section 20.

4.8 Environment

Environmental studies, closure plans and costs, and environmental liabilities and issues are discussed in Section 20.

4.9 Social License

The potential social and community impact assessments of the Project are discussed in Section 20.

4.10 Significant Risk Factors

The regulatory permitting process for a vanadium heap leach project may require additional geochemical baseline data collection and closure planning, as this type of project has not been permitted before in the State of Nevada. Although similar to a copper heap leach, also limited in the State of Nevada, no specific regulatory guidelines or procedures have been established for this type of process and therefore agency concurrence with data collection protocols and the determination of data adequacy and closure design may be subject to additional reviews and revisions.

4.11 Comments on Section 4

In the opinion of the AMEC QPs, the following conclusions are appropriate:

- Information from American Vanadium and legal experts supports that the mining tenure held is valid and is sufficient to support declaration of Mineral Resources and Mineral Reserves
- American Vanadium has confirmed that a total of 70 claims are held by way of agreement with third-parties. Royalties are associated with these agreements as follows:
  - Dietrich royalty: 2.5 percent NSR until royalty payments reach a total of $3 million, where the royalty decreases to 2.0 percent

  - MSM royalty: production royalty of 3.0 percent NSR
  - Vanadium International royalty: production royalty of 2.5 percent NSR until royalty payments reach a total of $1 million, then the royalty is dropped.
- There has been no legal survey of the Project claims. Under Nevada law, each unpatented claim is marked on the ground, and does not require survey
- AMEC was supplied with legal opinion that indicates annual claim maintenance fees have been paid for 2010. American Vanadium has advised that the 2011 maintenance payment, due prior to 1 September 2011, was paid
- Surface rights are held by the BLM
- Exploration to date has been conducted in accordance with Nevada regulatory requirements
- Additional permits will be required for Project development.

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

5.1 Accessibility

The Gibellini Project is accessed from Eureka by traveling southeast on US Highway 50 approximately 10 miles to Nevada State Route 379, then following SR 379 southwest for approximately eight miles to a fork in the road. At the fork, an improved gravel county road, on the right, is followed for approximately seven miles to where a two-track road on the west leads to the property. Access to the Project area is good, and is possible year-round.

5.2 Climate

The climate in the Gibellini area is typical for east–central Nevada. Average monthly high temperatures range from 74 degrees to 85 degrees Fahrenheit in the summer and 37 degrees to 47 degrees Fahrenheit in the winter. Yearly rainfall averages approximately 12 inches with nearly uniform distribution from September through May. June, July, and August are typically hot and dry months; December, January, and February receive the bulk of the snowfall (Weather Channel website, 2006).

Exploration is possible year round, though snow levels in winter and wet conditions in late autumn and in spring can make travel on dirt and gravel roads difficult. It is expected that mining operations will be able to be conducted year-round.

5.3 Local Resources and Infrastructure

The nearest town to the Property is Eureka, Nevada, which is situated along US Highway 50 and hosts a population of 1651 (Census 2000 data). The nearest city is Reno, Nevada, approximately 215 miles to the west, which hosts a population of 180,480 (Census 2000 data). The most significant towns in the Project vicinity are Carlin, which has a rail-head, and Elko, which is the northeastern regional mining center.

Local resources necessary for the exploration and possible future development and operation of the Gibellini Project are located in Eureka. Some resources would likely have to be brought in from the Elko and Ely areas.

Nevada has a long mining history and a large resource of equipment and skilled personnel. Workers would likely be imported from Elko County (Carlin and Elko) to supplement the work force available in Eureka.

The 24.5 miles leading to the mine site is State owned and is either paved or improved gravel. The three miles of road access from Nevada State Route 379 to the mine is a two-track dirt road. The road can be upgraded to service the planned mining operation. This upgraded road would be the prime method of transport for goods and materials in and out of the Project.

The nearest power line to the Project is located approximately seven miles north and services the Fish Creek Aradan Ranch. Exploration activities are serviced by diesel generator as required. Water is supplied for exploration purposes from wells.

There are currently no communications facilities on site.

Infrastructure requirements for Project development as detailed within the Feasibility Study are discussed in Section 18 of this Report.

5.4 Physiography

The Gibellini Project is located on the east flank of the Fish Creek Range along a northwest-trending ridge. Elevation at the Project ranges from 6,600 to 7,131 feet above mean sea level and the topographic relief can be characterized as moderate to steep.

Vegetation is typical of the Basin and Range physiographic province. The Project is covered by sagebrush, grass, and various other desert shrubs. Fauna that have been observed in the Gibellini Project area are typical of those of the Great Basin area.

5.5 Sufficiency of Surface Rights

There is sufficient area within the Project to host an open pit mining operation, including any proposed open pit, waste dumps, tailings, and leach pads.

5.6 Comments on Section 5

In the opinion of the QPs:

- The existing and planned infrastructure, availability of staff, the existing power, water, and communications facilities, the design and budget for such facilities, and the methods whereby goods could be transported to any proposed mine, and any planned modifications or supporting studies are reasonably well-established, or the requirements to establish such, are reasonably well understood by American

Vanadium, and can support the declaration of Mineral Resources and Mineral Reserves.

- There is sufficient area within the Project to host an open pit mining operation, including any proposed open pit, waste dumps and leach pads.
- It is a reasonable expectation that surface rights to support operations can be obtained. No easements or rights of way are required for access over public lands. American Vanadium has advised AMEC that a right-of-way for the power line access is expected to be applied for, and will be held in the name of, Mt Wheeler Power. This right of way will also be the probable location for the proposed water pipeline from the Don Hull ranch.
- It is expected that any future mining operations will be able to be conducted year-round.

6.0 HISTORY

In 1942, Mr. Louis Gibellini located claims covering the Gibellini manganese–nickel mine (also known as the Niganz manganese–nickel mine) immediately east of the Gibellini Hill deposit. The deposit was intermittently mined until the mid-1950s. Workings at the mine consist of a shaft 37 ft deep, an adit 176 ft long, several shallow pits, and some trenches. Manganese mineralization consists of pyrolusite and dense nodules of psilomene within Devonian limestone on the footwall of a northeast-trending fault zone. The average grade of the ore produced from the workings was about 9.5% manganese, 2.8% zinc, and 1.22% nickel. A shipment of 95.4 tons of mineralization in 1953 to the Combined Metals Company mill in Castleton, Nevada, reportedly contained 31.6% manganese (Roberts et al., 1967).

In 1956, Union Carbide discovered vanadium mineralization one mile south of the Gibellini manganese–nickel mine, on what is now known as the Louie Hill prospect. A resource estimate was completed in 1969 (Joralemon, 1969). The Gibellini Hill deposit was discovered shortly thereafter.

The Gibellini Hill deposit was first explored by Siskon Co. in 1960 to 1961 (Roberts et al, 1967). Cheschey & Co. (1960–1963), Terteling & Sons (1964–1965), and Atlas and TransWorld Resources (1969) reportedly worked one or both of the deposits during the 1960s (Morgan, 1989). Work during this period included rotary drilling, trenching, mapping and metallurgical testing. Terteling & Sons drilled 33 rotary holes in the Gibellini area and Atlas drilled 77 holes. Cheschey & Co. appear to have drilled several holes in the area, but no information from these holes remain beyond a drill hole location map. The low grade and complex metallurgy of the deposits, together with the low trading price of V_2O_5 at the time (about $2.50 per pound) discouraged further development (Morgan, 1989).

In 1972, Noranda optioned claims covering the Gibellini Hill and Louie Hill areas. In the same year, metallurgical research on Gibellini Hill drill hole composite samples and mine and market economic studies by the Colorado School of Mines Research Institute (CSMRI) indicated that the Gibellini Hill deposit was potentially economic. In 1972 and 1973 Noranda drilled 52 rotary and reverse circulation (RC) drill holes in the Gibellini Hill deposit to provide data for a mineral resource estimate and to provide material for additional metallurgical testing. Five holes were also drilled in the Louie Hill area at this time.

Based upon the drilling results, Noranda completed a resource estimate using polygonal methods (Condon, 1975). Noranda did not use the assays from the Terteling or Atlas drill holes in their resource estimate. Noranda's review of previous drilling noted 'serious discrepancies in grade and continuity of mineralization between holes' (Condon, 1975).

Noranda conducted extensive research into the metallurgy of the Gibellini Hill mineralization. They found that acceptable extractions could be achieved by sulfuric acid extraction, but at that time, reagent costs were prohibitive. In 1974, after critical review of the CSMRI work and in-house investigations into the metallurgy of the vanadium ores, Noranda concluded the Gibellini Hill deposit was not economically viable.

Noranda also completed a resource estimate on the Louie Hill prospect but noted that further work was required before an accurate resource estimate could be performed (Condon, 1975). Morgan (1989), using the Noranda drill plan and ore blocks, estimated a mineral resource for Louie Hill.

Inter-Globe picked up the Gibellini Project in 1989 and contracted James Askew Associates (JAA) to drill 11 vertical RC holes to confirm grades reported in Noranda, Atlas, and Terteling drilling and to provide material for metallurgical test work (JAA, 1989a). JAA also mapped and sampled nine trenches and pits constructed by previous operators (JAA, 1989b).

Vanadium grades from the Inter-Globe drill holes confirmed the width and grade of the Noranda, Terteling, and Atlas drill holes (JAA, 1989a). There is no evidence that the planned metallurgical testing took place; the report/results were not provided to AMEC.

RMP acquired the property in March 2006. During 2006, RMP expanded the land position of the Gibellini Project, mapped the surface geology, collected surface and underground geochemical samples, and conducted preliminary metallurgical testwork.

RMP commissioned AMEC to review exploration work completed on the Project and to develop a mineral resource estimate conforming to CIM Definition Standards for Mineral Resources and Mineral Reserves (2005), as referenced by Canadian National Instrument 43-101. This work was the subject of a Technical Report completed in April 2007.

Following this initial technical report, RMP completed RC and diamond drilling, and additional metallurgical testwork. As a result of encouraging results, RMP commissioned AMEC to complete a preliminary assessment for the Gibellini Hill deposit. The preliminary assessment returned positive Project economics under the assumptions used, and indicated that a heap leach operation producing vanadium pentoxide was the most likely process flowsheet for more detailed studies.

In January 2011, RMP changed its name to American Vanadium Corp. The Project is operated through the wholly-owned subsidiary, American Vanadium US Inc.

A Feasibility Study was commissioned in late 2010, and the remainder of this Report discusses the updated Mineral Resources and outlines the Mineral Reserves and proposed mine plan and project economics from that study.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Gibellini property occurs on the east flank of the southern part of the Fish Creek Range (Figure 7-1).

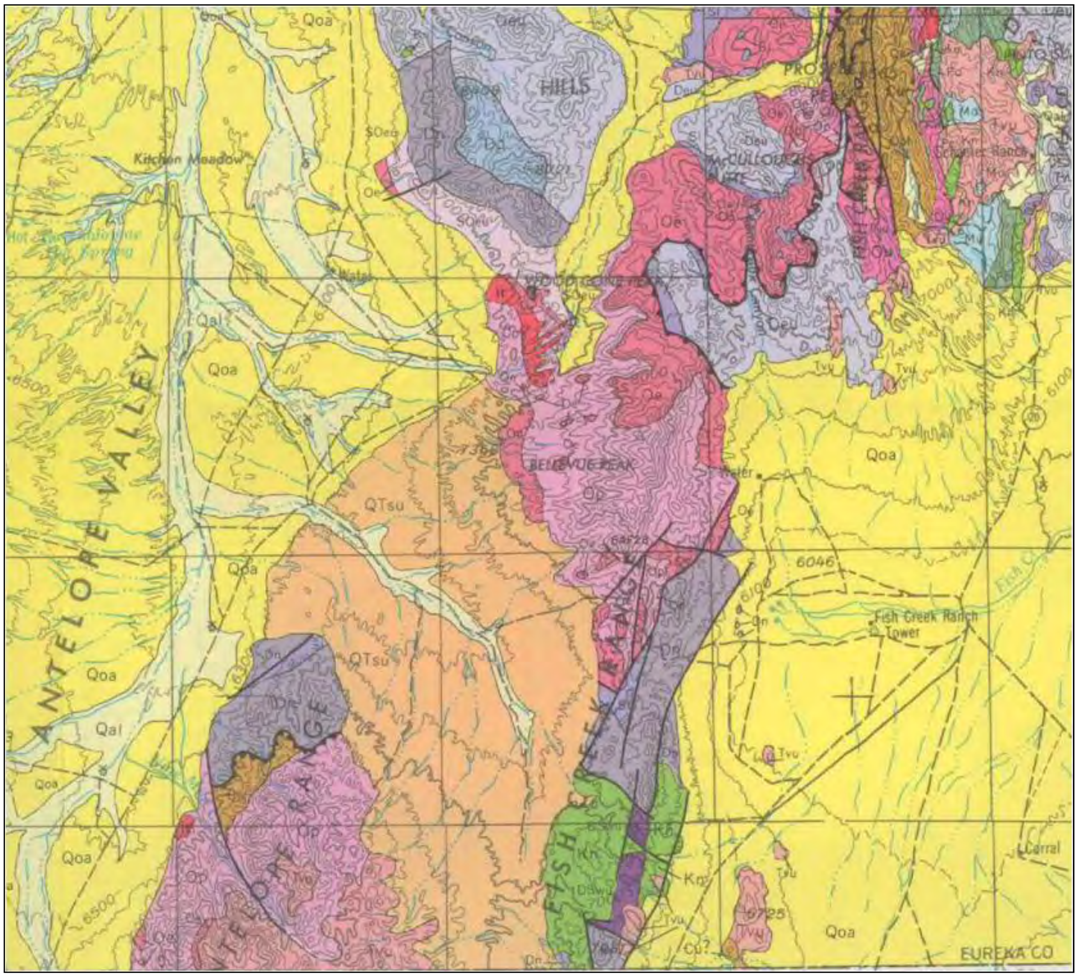
The southern part of the Fish Creek Range, consists primarily of Paleozoic sedimentary rocks of Ordovician to Mississippian Age of the eastern carbonate, western siliceous, and overlap assemblages. Tertiary volcanic rocks crop out along the eastern edge of the range and Tertiary to Quaternary sedimentary rocks and alluvium bound the range to the west and east in the Antelope and Little Smoky valleys, respectively. North to northeast-trending faults dominate in the region, particularly along the eastern range front (Roberts et al., 1967).

The Gibellini property lies within the Fish Creek Mining District. The limestone hosted Gibellini Manganese-Nickel mine and the Gibellini Hill and Louie Hill black-shale hosted vanadium deposits are the most significant deposits in the district and all occur within the Gibellini property boundary. The Bison-McKay black-shale hosted vanadium deposit occurs several miles south of the Gibellini property. A fluorite–beryl prospect and silver–lead–zinc vein mines with minor production are also reported to occur in the district (Roberts et al., 1967).

7.2 Project Geology

The Gibellini Hill deposit occurs within an allocthonous fault wedge of organic-rich siliceous mudstone, siltstone, and chert, which forms a northwest trending prominent ridge. These rocks are mapped as the Gibellini facies of the Woodruff Formation of Devonian Age (Desborough et al., 1984). These rocks are described by Noranda as thin-bedded shales, very fissile and highly folded, distorted and fractured (Condon, 1975). In general, the beds strike north-northwest and dip from 15 to 50° to the west. Outcrops of the shale are scarce except for along road cuts and trenches. The black shale unit which hosts the vanadium resource is from 175 feet to over 300 feet thick and overlies gray mudstone. The shale has been oxidized to various hues of yellow and orange up to a depth of 100 feet. The Woodruff Formation is interpreted to have been deposited as eugeosynclinal rocks (western assemblage) in western Nevada that have been thrust eastward over miogeosynclinal rocks (eastern assemblage) during the Antler Orogeny in late Devonian time.

Figure 7-1: Regional Geology Map



Qal	Qoa	QTsu	Tvu	Kn
Alluvium	Older Alluvium	Sedimentary deposits, undivided	Volcanic Rock, undivided	Newark Canyon Formation
Dn	DSwu	Oe	Op	
Nevada Formation	Sedimentary rocks, undivided	Eureka Quartzite	Pogonip Group	

The Gibellini facies is structurally underlain by the Bisoni facies of the Woodruff Formation. The Bisoni unit consists of dolomitic or argillaceous siltstone, siliceous mudstone, chert, and lesser limestone and sandstone (Desborough and others, 1984).

Structurally underlying the Woodruff Formation are the coarse clastic rocks of the Antelope Range Formation. These rocks are interpreted to have been deposited during the Antler Orogeny and are attributed to the overlap assemblage.

The Louie Hill deposit is located in the same formation and lithologic units as the Gibellini Hill deposit. The general geology in this area is thought to be similar to the Gibellini Hill deposit area.

The ridge on which the Gibellini Manganese-Nickel mine (Niganz mine) lies is underlain by yellowish-gray, fine-grained limestone. This limestone is well bedded with beds averaging two feet thick. A fossiliferous horizon containing abundant Bryozoa crops out on the ridge about 100 feet higher than the mine. The lithologic and faunal evidence suggest that this unit is part of the Upper Devonian Nevada Limestone. Beds strike at N18E to N32W and dip at 18 degrees to 22 degrees west. The manganese–nickel mineralization occurs within this unit. Alluvium up to 10 feet thick overlies part of the area, and is composed mostly of limy detritus from the high ridge north of the mine. Minor faulting has taken place in the limestone near the mine. A contact between the ore and overlying limestone strikes northeast and dips at 25 degrees northwest. This may be either a normal sedimentary contact or a fault contact (interpreted to be thrush fault but evidence is inconclusive).

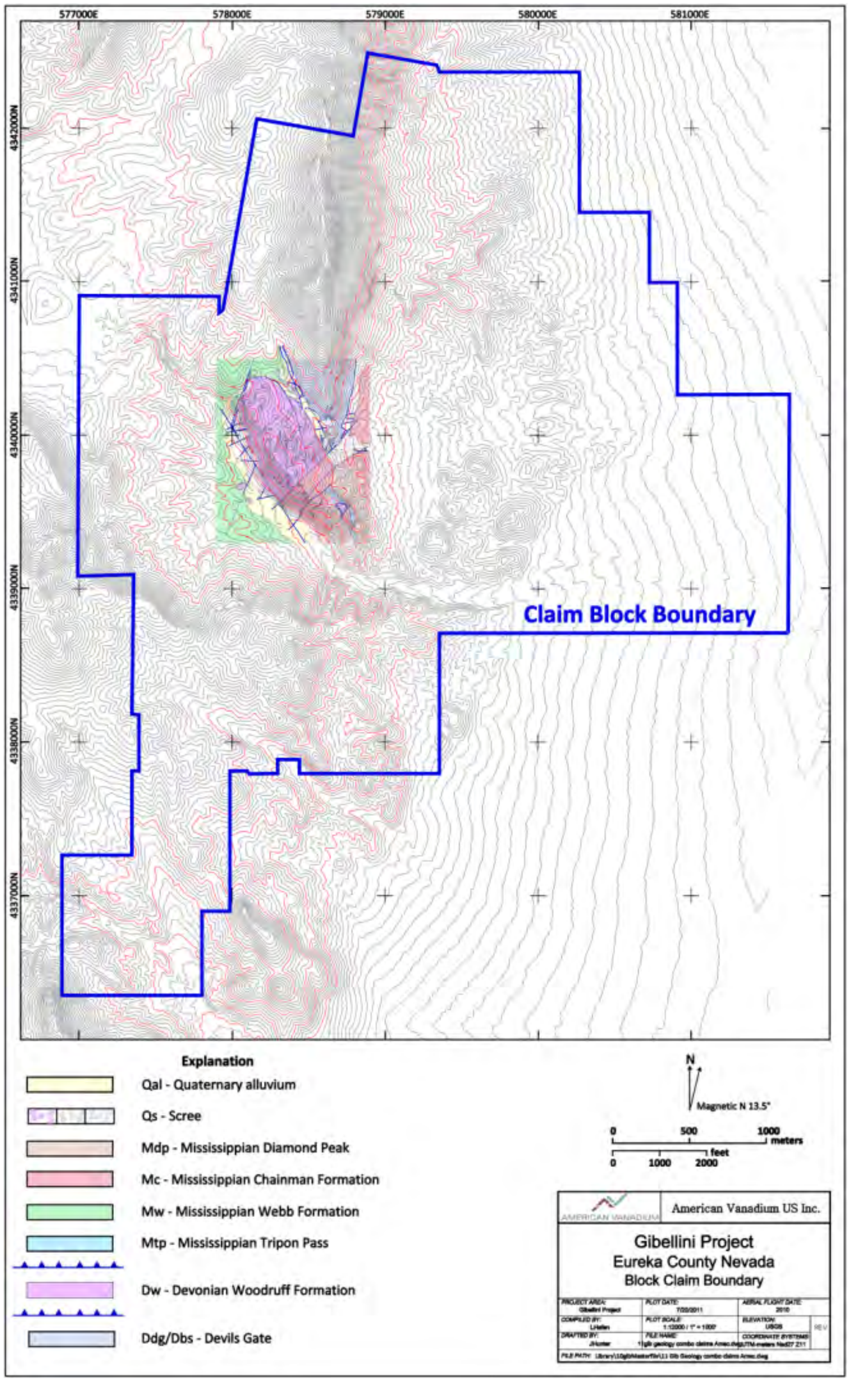
Figure 7-2 shows the Project geology at a regional scale.

7.3 Gibellini Hill Deposit

The Gibellini Hill deposit occurs within organic-rich siliceous mudstone, siltstone, and chert of the Gibellini facies of the Devonian Age Woodruff Formation (Figure 7-3).

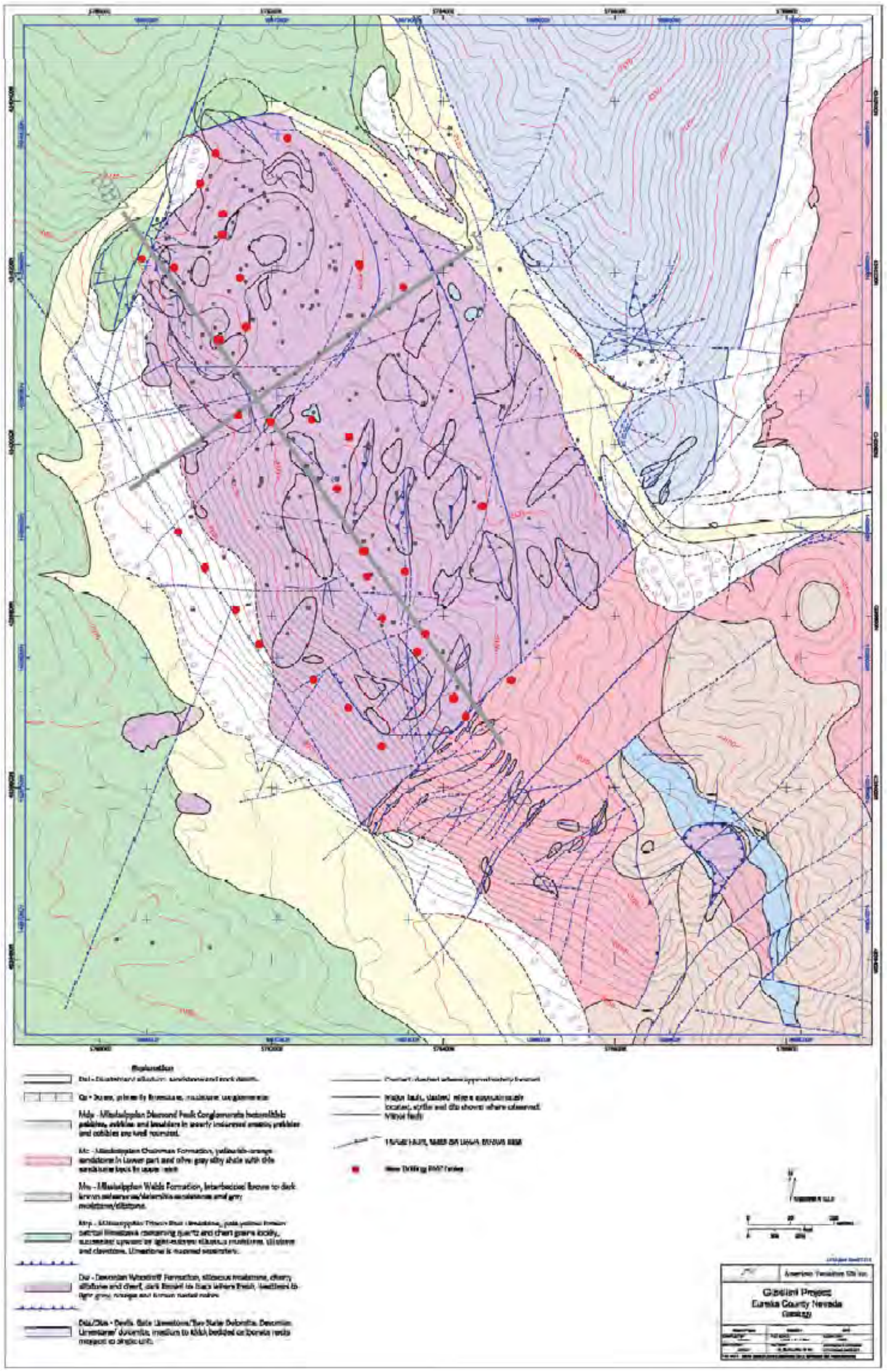
In general, the beds strike north-northwest and dip from 15 degrees to 50 degrees to the west. The black shale unit which hosts the vanadium Mineral Resource is from 175 feet to over 300 feet thick and overlies gray mudstone of the Bisoni facies. The shale has been oxidized to various hues of yellow and orange up to a depth of 100 feet.

Figure 7-2: Gibellini Property Geological Map



Note: Figure courtesy American Vanadium

Figure 7-3: Gibellini Hill Deposit Geology Map



Note: Figure courtesy American Vanadium. New drilling indicated drill hole collar locations from the 2010 drill program.

Descriptions of the lithological units mapped at the Gibellini Hill deposit are as follows:

- Qal – Quaternary alluvium, sandstone and rock debris,
- Qs – Scree, primarily limestone, mudstone conglomerate,
- Mdp – Mississippian Diamond Peak Conglomerate heterolithic pebbles, cobbles and boulders in poorly-indurated matrix, pebbles and cobbles are well rounded,
- Mc – Mississippian Chainman Formation, yellowish-orange sandstone in lower part and olive gray silty shale with thin sandstone beds in upper part,
- Mw – Mississippian Webb Formation, interbedded brown to dark brown calcareous/dolomitic sandstones and gray mudstone/siltstone,
- Mtp – Mississippian Tripon Pass Limestone, pale yellow–brown detrital limestone containing quartz and chert grains locally succeeded upward by light-colored siliceous mudstone, siltstone and claystone,
- Dw – Devonian Woodruff Formation, siliceous mudstone, cherty siltstone and chert, dark brown to black where fresh, weathers to light gray, orange and brown pastel colors, and
- Ddg/Dba - Devonian Devils Gate Limestone/Bay State Dolomite, medium- to thick-bedded carbonate rocks. Forms resistant ledges up to 10 feet thick. Locally dolomitic where altered.

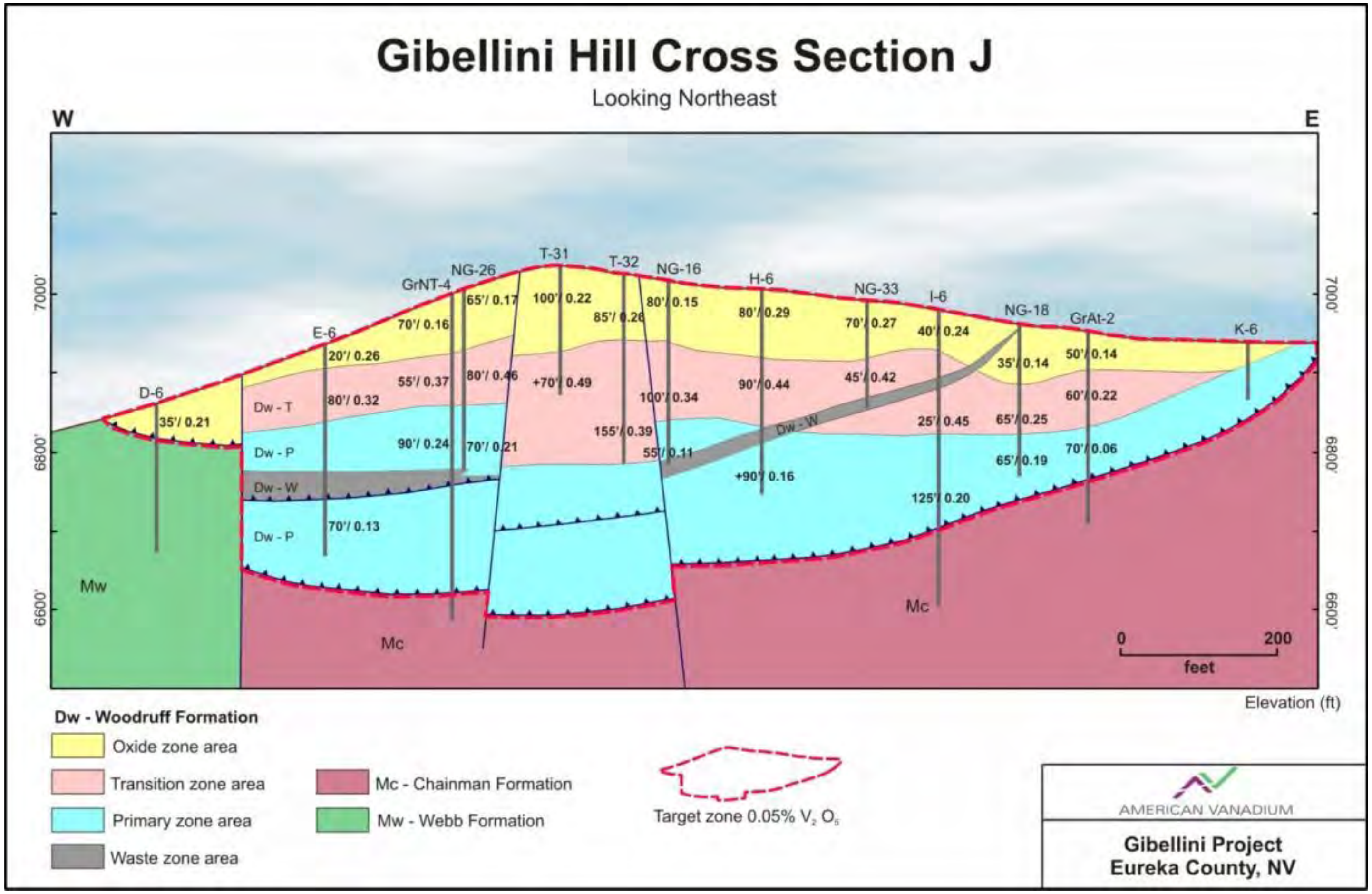
Figure 7-4 and Figure 7-5 are cross and long sections through the Gibellini Hill deposit (named Gibellini Hill on the sections) showing typical V_20_5 grades, alteration (oxidation), and lithologic units.

Alteration (oxidation) of the rocks is classified as one of three oxide codes: oxidized, transitional, and reduced. Vanadium grade changes across these boundaries. The transitional zone reports the highest average grades and RMP geologists interpret this zone to have been upgraded by supergene processes.

7.4 Louie Hill

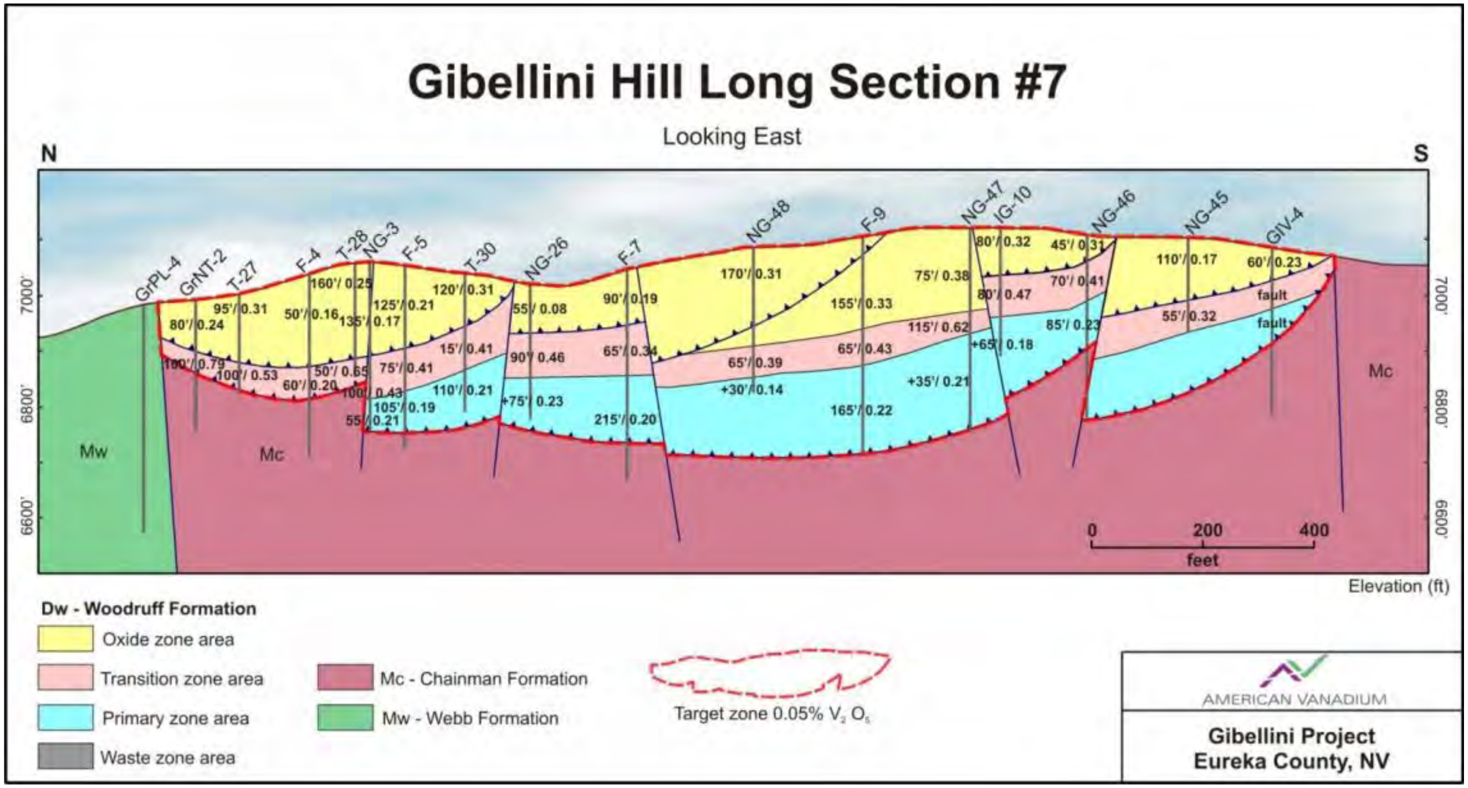
The Louie Hill Deposit lies approximately 500 meters south of the Gibellini Hill Deposit, being separated from the latter by a prominent drainage. Mineralization at Louie Hill is hosted by organic-rich siliceous mudstone, siltstone and chert of the Gibellini facies of the Devonian Woodruff Formation and probably represents a dissected piece of the same allochthonous fault wedge containing Gibellini Hill.

Figure 7-4: Cross Section Across Gibellini Hill, Looking Northwest. Red Outline Shows the 0.050% V_2O_5 Grade Shell Outline with Drill Hole Trace



Note: Figure courtesy American Vanadium

Figure 7-5: Long Section Across Gibellini Hill, Looking Northeast. Red Outline Showing 0.050% V_2O_5 Grade Shell with Drill Hole Trace. East Grid Lines are Spaced 500 Feet Apart



Note: Figure courtesy American Vanadium

Mineralized beds cropping out on Louie Hill are often contorted and shattered but in general strike in a north–south direction, and dip to the west 0 to 40º.

Rocks underlying the Louie Hill Deposit consist of mudstone, siltstone and fine-grained sandstone probably of Mississippian age (Webb and/or Chainman Formations).

Oxidation of the mineralized rocks has produced light-colored material with local red and yellow bands of concentrated vanadium minerals.

A geological section through the Louie Hill deposit is included as Figure 7-6.

7.5 Mineralization and Alteration

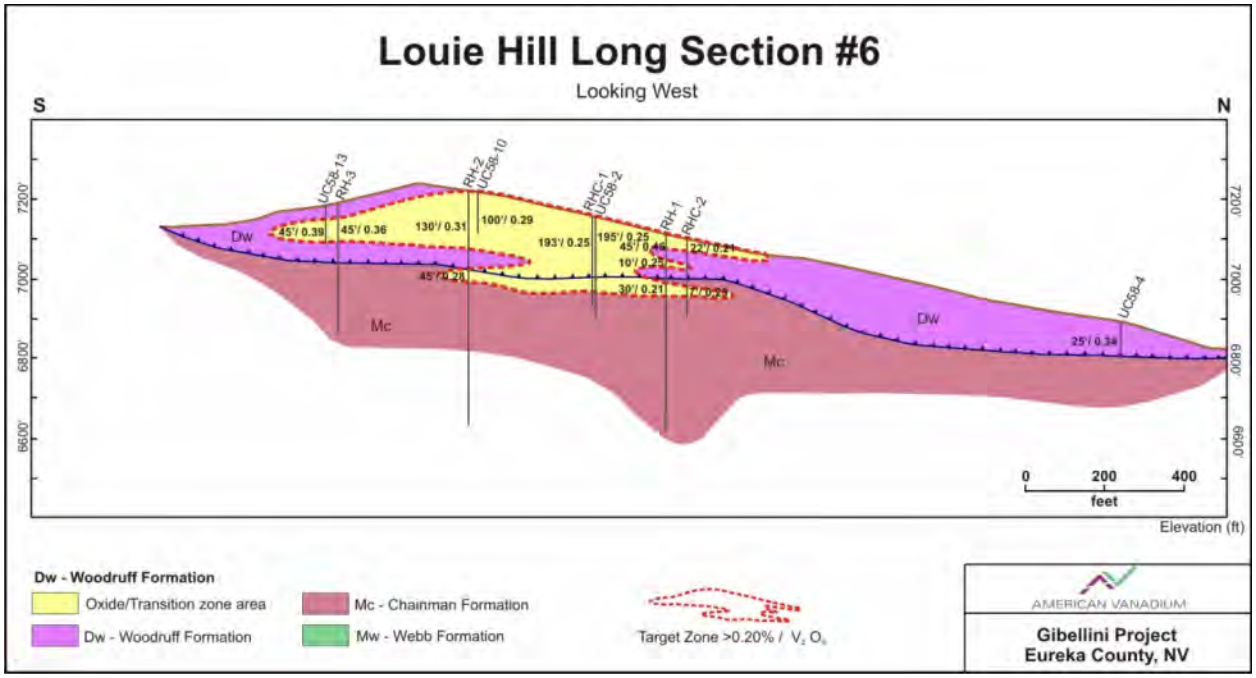
Vanadium mineralization at Gibellini Hill and Louie Hill is hosted in black shale sedimentary rocks. Mineralization is tabular, conformable with bedding, and remarkably continuous in grade and thickness between drill holes.

Alteration of the rocks is limited to oxidation and is classified as one of the three oxide codes: 1 = oxidized, 2 = transitional, and 3 = reduced. Vanadium grades change across these boundaries. The transitional zone reports the highest average grades, the oxide zone reports the next highest average grades, and the reduced zone reports the lowest average grades.

In the oxidized zone, complex vanadium oxides occur in fractures in the sedimentary rocks including metahewettite ($CaV_6O_{16}{\cdot}H_2O$), bokite ($KAl_3Fe_6V_{26}O_{76}{\cdot}30H_2O$), schoderite ($Al_2PO_4VO_4{\cdot}8H_2O$), and metaschoderite ($Al_2PO_4VO_4{\cdot}6\text{-}8H_2O$). In the reduced sediments, vanadium occurs in organic material (kerogen) made up of fine grained, flaky, and stringy organism fragments less than 15 micrometers in size (Bohlke et al., 1981).

Other workers found vanadium mineralization to occur within manganese modules (psilomene family) in the shale (Assad and Laguiton, 1973). X-ray diffraction (XRD) mineral identification by SGS Lakefield Research in Ontario, Canada reported the occurrence of the vanadium mineral fernandinite ($CaV_8O_{20}{\cdot}H_2O$) (SGS, 2007). Other minerals reported to occur at Gibellini are marcasite, sphalerite, pyrite, and molybdenite (Desborough et al., 1984).

Figure 7-6: Long Section Across Louie Hill, Looking West. Red Outline Showing 0.20% V_2O_5 Grade Shell with Drill Hole Trace.



Note: Figure courtesy American Vanadium

7.6 Prospects

The ridge on which the historic Gibellini manganese–nickel mine lies is underlain by yellowish-grey, fine-grained limestone. This limestone is well bedded with beds averaging two feet thick. A fossiliferous horizon containing abundant bryozoan remains crops out on the ridge about 100 feet higher than the mine. The lithologic and faunal evidence suggest that this unit is part of the Upper Devonian Nevada Limestone. Beds strike N18E to N32W and dip at 18º to 22º to the west.Mineralization at the Gibellini manganese–nickel mine is composed essentially of manganese oxides in a pipe-like structure.

Bodies of manganese–nickel mineralization occur within this unit. Alluvium, up to 10 ft thick, mantles part of the area, and is composed mostly of limy detritus from the high ridge north of the mine. Minor faulting has taken place in the limestone near the mine.

A contact between the mineralization and overlying limestone strikes northeast and dips at 25º to the northwest. This may be either a normal sedimentary contact or a fault contact (interpreted to be a thrust fault but evidence is inconclusive).

Anomalous amounts of zinc, vanadium, and nickel occur in the mineralization but no minerals incorporating these metals have been found. The origin of the deposit is not known. The mineralized zone may represent a hydrothermal deposit in a favorable, porous bed which has since been leached leaving only the manganese oxides. It may also represent a residual concentration derived from the erosion of nearby manganese-rich blocks. Another alternative is that the deposit may have a sedimentary origin, with the manganese oxides having been directly precipitated during a given period of deposition.

Pyrolusite and psilomelane are the manganese ore minerals at the Gibellini manganese–nickel mine. They occur together as a mixture of black, earthy material with dense, metallic layers showing botryoidal structures.

7.7 Comments on Section 7

In the opinion of the QPs:

- Knowledge of the deposit settings, lithologies, and structural and alteration controls on mineralization is sufficient to support Mineral Resource and Mineral Reserve estimation
- The mineralization style and setting of the Project deposit is sufficiently well understood to support Mineral Resource and Mineral Reserve estimation

- Prospects and geophysical targets (refer to Section 9.9) are at an earlier stage of exploration, and the lithologies, structural, and alteration controls on mineralization are currently insufficiently understood to support estimation of Mineral Resources.

8.0 DEPOSIT TYPES

The vanadium mineralization of the Gibellini Hill and Louie Hill areas is hosted in black shale sedimentary rocks. Mineralization is tabular, conformable with bedding, and remarkably continuous in grade and thickness between drill holes.

Limited mineralogical work conducted in the early 1970s suggests that the vanadium occurs within manganese nodules in the shale (Assad and Laquitton, 1973). Desborough et al. (1984) reported that vanadium occurs principally in association with organic matter and that metahewettite is the main vanadium mineral in the oxidized zone. Vanadium mineralization is thought to be the result of syngenetic and early diagenetic metal concentration in the marine shale rocks.

The mineralization at the Gibellini manganese–nickel mine forms a pipe-like structure hosted in limestone, is primarily enriched in manganese, zinc, and nickel, and may be hydrothermal or sedimentary in origin, or a combination of the two.

Similarities with the style of mineralization for the Project exist in the USGS manganese nodule model, model 33a of Cox and Singer (1986).

9.0 EXPLORATION

9.1 Grids and Surveys

In 1972, Noranda contracted Olympus Aerial Surveys (OAS) of Salt Lake City, Utah, to conduct an aerial photographic survey over the Gibellini Project and Bisoni-McKay deposit to provide a 1:1,200 scale (1"=100') base map for mapping and sampling activities. AMEC contacted OAS in an attempt to reclaim digital results from the original work and was informed that nothing remained from the original work. The 25 foot contour lines from the Noranda base map were digitized by AMEC to provide the topographic control for the Gibellini Hill resource estimate in 2008.

During 2007–2008, topographic contours for Gibellini Hill were digitized by AMEC on 25 foot contour intervals, using a locally-established mine grid coordinate system (AMEC, 2007). The topography encompassed the immediate mineralized area. The mine coordinate system has been converted to UTM NAD27. Grid coordinate conversion was conducted by RMP using a visual best-fit method by lining up contours and drill holes from one topographic map with the other.

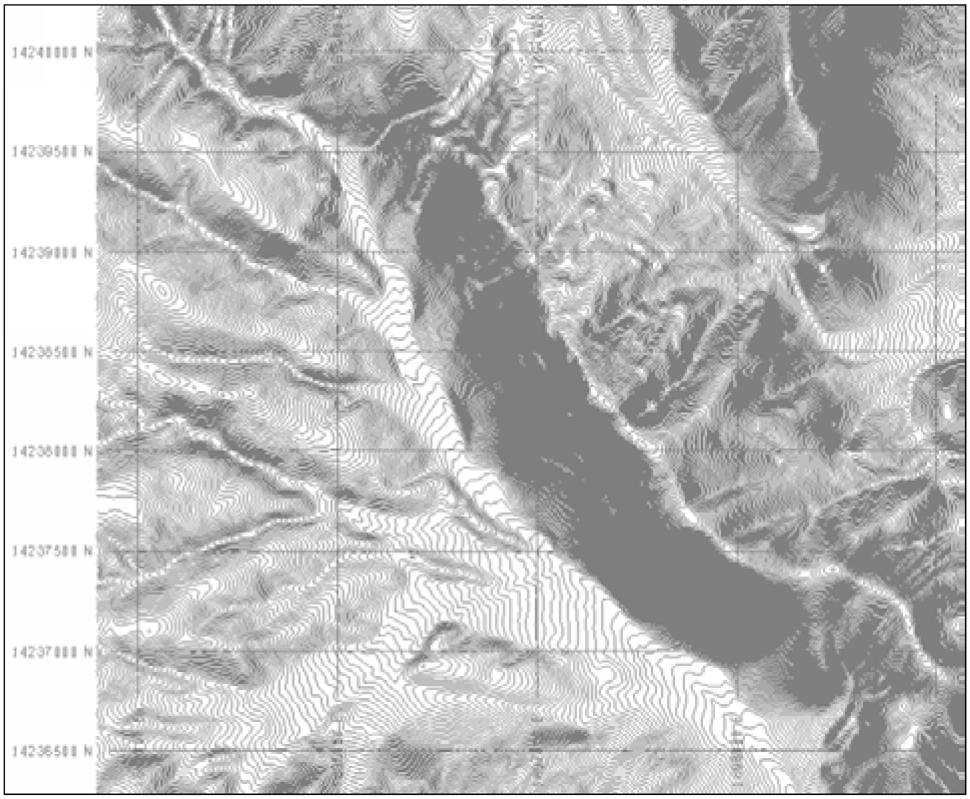
For the purposes of the Feasibility Study, aerial photos and graphics were generated by Photosat of Vancouver, Canada. Satellite data were collected as 50 cm stereo satellite photos with a photo pixel size set at 50 cm. Topographic contours were produced at intervals of 1 m, 5 m, 10 m and 50 m. The topographic photos were delivered to American Vanadium in ASCII XYZ and 3D DWG file formats in both meters and US survey feet. Figure 9-1 shows an example of the contoured files.

The PhotoSat-produced topography covers sufficient extent of the ground in the project area and has an overall relative horizontal accuracy of ±6.6 feet (±2 meters) over 6.2 miles (10 kilometres). The vertical accuracy is approximately ±1 foot (±30 centimeters).

9.2 Geological Mapping

In 2006, RMP geologists mapped the Gibellini Project at a scale of 1" = 200 m (656 ft). Results from this mapping effort are shown earlier in Figure 7-2. This mapping program identified additional targets for both vanadium and manganese oxide mineralization on the property.

Figure 9-1: Gibellini 2010 Surface Topography



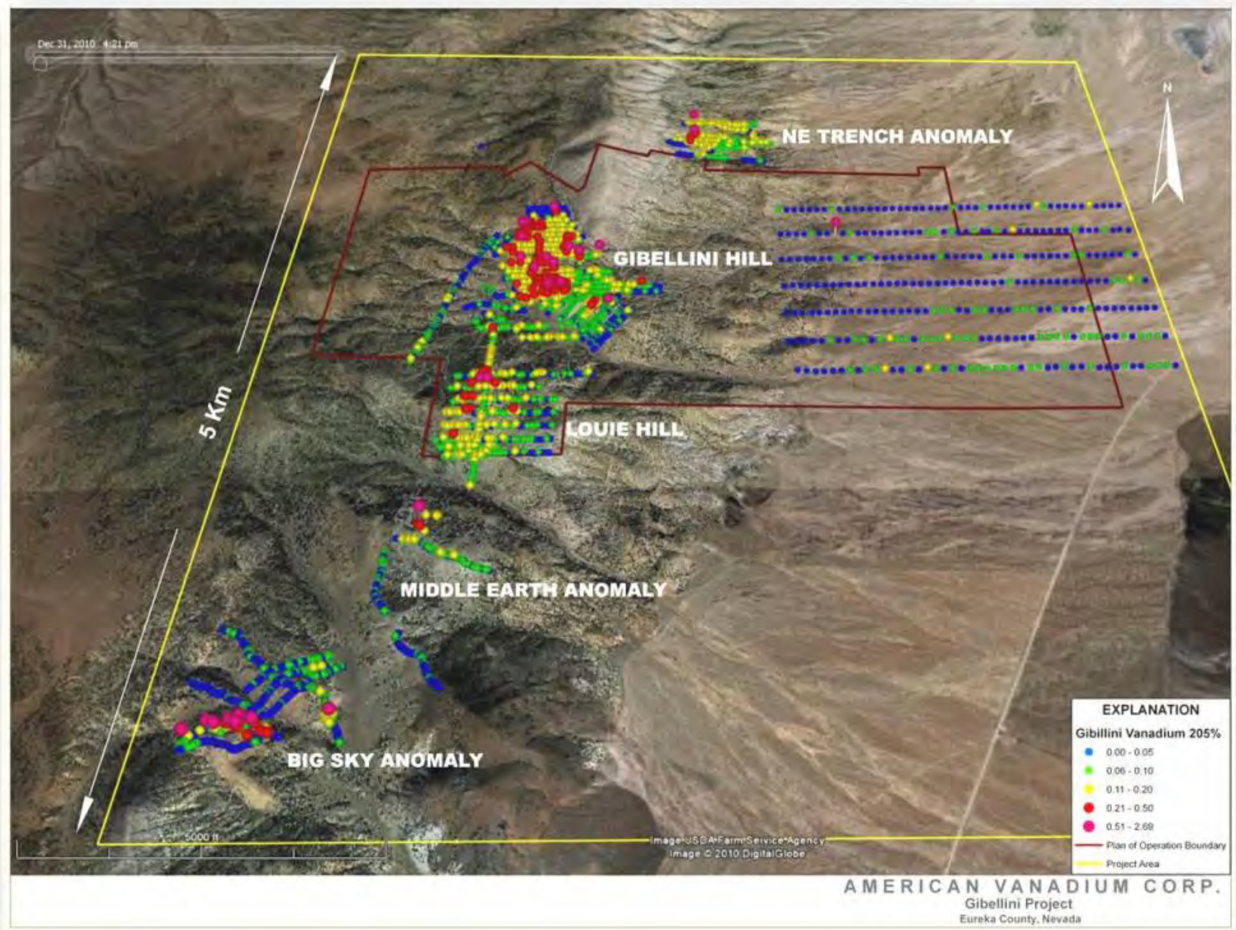
9.3 Geochemical Sampling

RMP geologists collected 20 rock-chip samples from surface outcrops of strong mineralization around the historic Gibellini manganese–nickel mine, returning consistently elevated values of Mn, Zn, Ni, V, Mo, Co, and Cu. An additional 464 rock-chip samples from the Gibellini Hill deposit and surrounding areas confirmed anomalous concentrations and thicknesses of vanadium mineralization.

9.4 Geophysics

During 2010–2011, American Vanadium completed a surface sampling program using a field portable XRF unit (Niton model XL3t) over the Project area. Approximately 1,800 determinations were made using the instrument. This work outlined three new areas of anomalous vanadium mineralization at Northeast Trench, Middle Earth and Big Sky, (Figure 9-2).

Figure 9-2: Niton XRF Survey Results



Note: Figure courtesy American Vanadium.

9.5 Pits and Trenches

In August, 1989, Inter-Globe mapped and sampled nine bulldozed trenches and seven backhoed pits throughout the Gibellini area (Figure 9-3). The purpose of the program was to evaluate the near-surface oxide mineralization (JAA, 1989b). A total of 173, five foot horizontal and vertical channel samples were collected and assayed for V_2O_5. The exact locations of these trenches were not surveyed and so the trench results have not been incorporated into the current resource database. The length-weighted average V_2O_5 assays for the trenches are shown in Table 9-1.

Inter-Globe concluded from this work that:

- Vanadium mineralization occurs in bedrock up to the base of overburden
- The depth of overburden varies from 0.5 ft to 7.0 ft
- Most mineralized beds are gently folded and dip at shallow angles
- Trench V_2O_5 assays compare well on average with assays from the top of the RC holes in the vicinity of the trenches (0.43% V_2O_5 in trenches vs. 0.48% V_2O_5 in RC).

9.6 Petrology, Mineralogy, and Research Studies

No research studies have been performed.

9.7 Geotechnical and Hydrological Studies

9.7.1 Geotechnical Studies

Site investigations have been undertaken to:

- Characterize and evaluate the subsurface soil and groundwater conditions at the proposed heap leach facility, pond and process plant area, related surface facilities areas, waste dump area, and access road
- Evaluate potential borrow source materials and locations
- Provide preliminary foundation recommendations for the plant and other surface facilities
- Identify seismic hazards.

The site investigation consisted of an extensive field program followed by laboratory test work and a seismic hazard analysis.

Figure 9-3 Inter-Globe Trench Mapping and Sampling Map

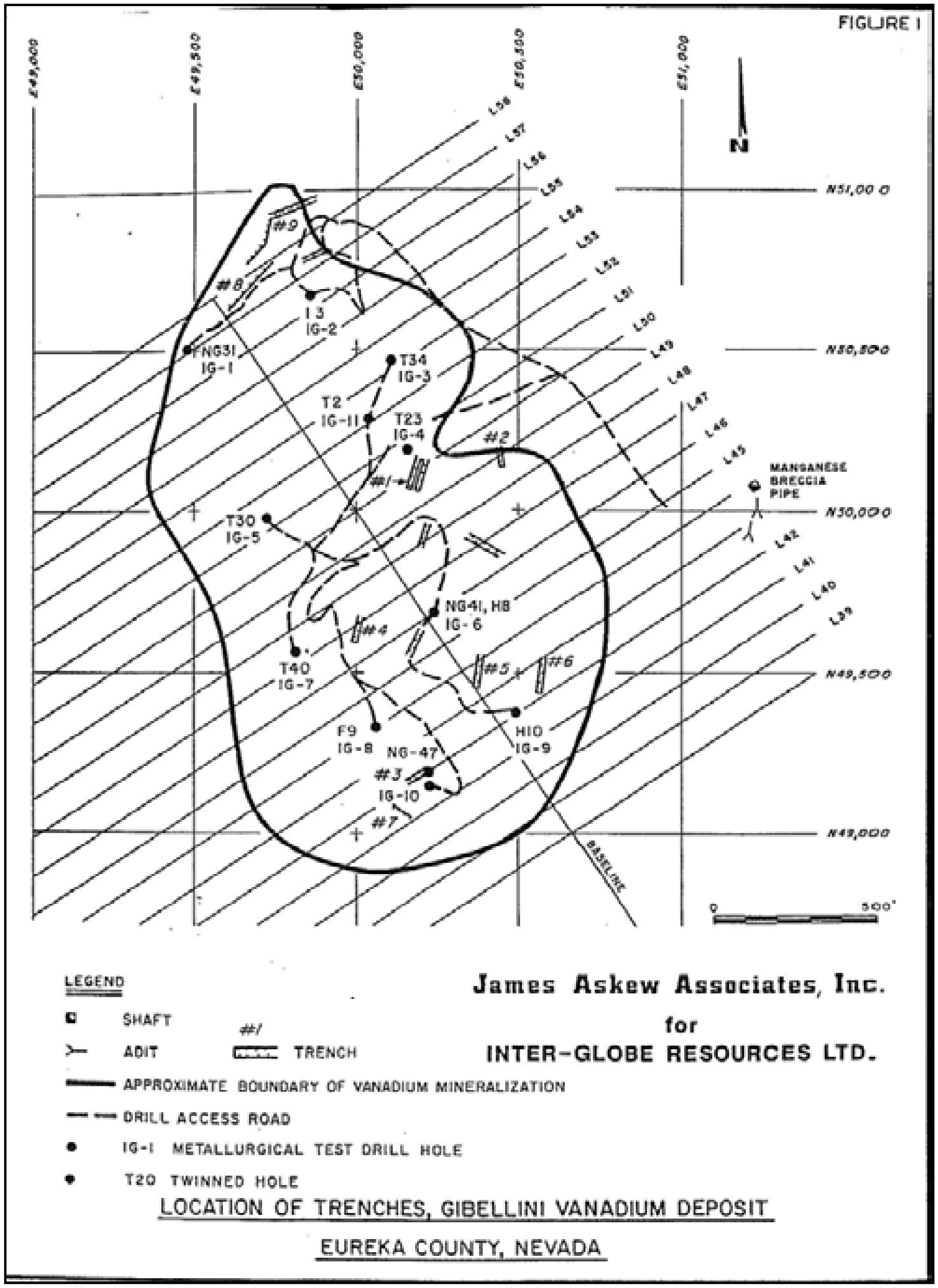


Table 9-1: Length-Weighted Average V_2O_5 Assays for Trenches Sampled by Inter-Globe

Trench	Length-weighted Assay V_2O_5 in %
BT-1	0.18
BT-2	0.35
BT-3	0.26
BT-4	0.34
BT-5	0.32
BT-6	0.14
BT-7	0.34
BT-8	0.56
BT-9	0.89

Geotechnical design work included reducing the geologic data obtained from oriented borings, vertical borings, and surficial mapping within the bounds of the proposed pit limits. The geologic data was subsequently used for structural assessment of discontinuities, quantifying rock mass and discontinuity strengths, and subsequently completing kinematic and limit equilibrium stability evaluations. The purpose of the above work was to develop feasibility level open pit geometry for use in mine planning.

The geotechnical design work included reducing the geologic data obtained from oriented borings, vertical borings, and surficial mapping within the bounds of the proposed pit limits. The geologic data was subsequently used for structural assessment of discontinuities, quantifying rock mass and discontinuity strengths, and subsequently completing kinematic and limit equilibrium stability evaluations. The purpose of the above work was to develop feasibility-level open pit geometry for use in mine planning.

A 30 percent probability of bench-scale failure (POF) and factor or safety of 1.2 or greater was considered acceptable for the pit slopes at Gibellini due to their relatively low overall slope height. Maintenance will be required in order to keep the catch benches clear of debris. Lower probability of failures, and flatter inter-ramp slopes, should be considered in areas above haul roads or other in pit facilities. The design bench face angles are the lowest in the southern sectors. Bench-scale wedge-type failures were shown to be the most critical mode of slope instability for all sectors.

9.7.2 Hydrological Studies

Enviroscientists conducted a spring, seep, and riparian study to identify surface water resources within the Little Smoky Valley Basin (155A). No springs, seeps, or riparian areas are located within the Project Area or vicinity.

Specific data were collected from the Project Area and vicinity and a water quality sample was collected from the Don Hull ranch well for partial analysis of the U.S. Environmental Protection Agency's Primary Drinking Water Standards.

Additional information on this work is provided in Section 20.

9.8 Metallurgical Studies

A number of phases of metallurgical testwork have been completed, and are discussed in Section 13.

9.9 Exploration Potential

Significant exploration potential remains in the Project area. The Feasibility Study is based only on the Gibellini Hill deposit, and does not include Louie Hill. American Vanadium's recent XRF survey has identified three additional vanadium oxide anomalies in the Project area.

9.10 Comments on Section 9

In the opinion of the QPs:

- The exploration programs completed to date are appropriate to the style of the deposits and prospects within the Project
- The exploration and research work supports the interpretations of the orogenesis of the deposits
- The Project retains significant exploration potential, and additional work is planned.

10.0 DRILLING

A total of 280 drill holes (about 51,265 ft) have been completed on the Gibellini Project since 1946, comprising 16 core holes (4,046 ft), 169 rotary drill holes (25,077 ft; note not all drill holes have footages recorded) and 95 RC holes (22,142 ft). Drilling is summarized by operator in Table 10-1. The Project drill collar location plan is included as Figure 10-1. Drill collars for the Gibellini Hill area are shown in Figure 10-2 and in Figure 10-3 for the Louie Hill area.

10.1 Legacy Drill Campaigns

A total of 35,789 ft of drilling in 173 drill holes was completed at Gibellini Hill in four drilling campaigns by Terteling, Atlas, Noranda, and Inter-Globe. Of this, 120 holes totaling 25,077 ft (70%) were drilled using conventional rotary (rotary) methods and 53 holes totaling 10,712 ft (30%) were drilled using reverse circulation (RC) methods. Terteling drilled holes in an uneven pattern in the central and northern parts of the vanadium resource area. Atlas drilled the main vanadium resource area in a rough 200 ft square grid pattern oriented parallel to the trend of the main ridge. Noranda re-drilled this same area with holes spaced 200 ft apart on sections oriented at 043° azimuth and spaced 200 ft apart. Inter-Globe drilled 11 metallurgical holes as twins of previous drill holes.

At Louie Hill, Union Carbide reportedly drilled a series of 60 holes at Louie Hill in 1956. Noranda completed five RC holes (610 ft) in 1973.

A total of 895.5 ft of drilling in four core drill holes was completed at the Gibellini manganese–nickel mine by the Nevada Bureau of Geology and Mining in 1946.

No cuttings, assay rejects, or pulps remain from these drilling campaigns.

10.2 American Vanadium/RMP Drill Campaigns

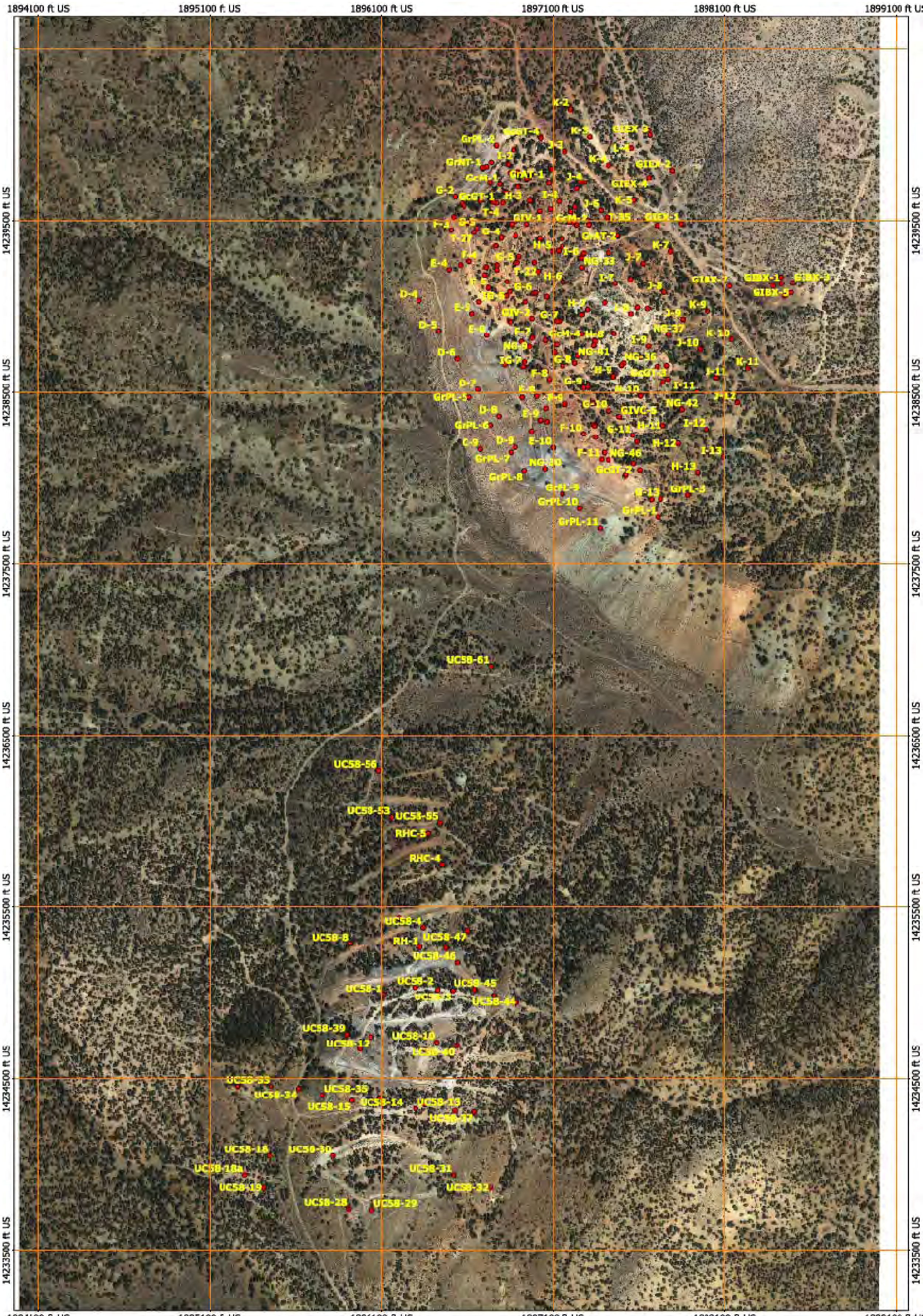
During 2007 and 2008, RMP completed a total of 9,040 ft of drilling in 30 drill holes on the Gibellini Project. Ten of these holes were drilled in the Gibellini Hill area, seven were drilled in the historic Gibellini manganese–nickel mine area, nine were drilled in the Louie Hill prospect area, and four exploration holes were drilled elsewhere on the property.

American Vanadium completed a total of 19 RC drill holes in 2010. Four drill holes were designed to twin Atlas legacy drill holes at Gibellini Hill, four drill holes were designed to twin Noranda legacy drill holes at Gibellini Hill, and eleven drill holes were designed to test the limits of the ultimate pit limit from the 2008 PA study.

Table 10-1: Drill Summary Table

Deposit	Campaign	Timeframe	Rotary Drill Holes	Rotary Drill Footage (ft)	RC Drill Holes	RC Drill Footage (ft)	Core Drill Holes	Core Drill Footage (ft)
Gibellini Hill	Union Carbide	1956	49	unknown	—	—	—	—
	Terteling	1964–1965	33	5,695	—	—	—	—
	Atlas	1969	77	17,000	—	—	—	—
	Noranda	1972–1973	10	2,382	42	8,174	—	—
	Inter-Globe	1989	—	—	11	2,538	—	—
	American Vanadium	2007	—	—	4	1,500	5	1,650
	American Vanadium	2008	—	—	—	—	1	300
	American Vanadium	2010	—	—	19	4930	—	—
Louie Hill	Union Carbide	60	unknown	—	—	—	—	—
	Noranda	1973	—	—	5	610		
	American Vanadium	2007	—	—	3	1,430	—	—
	American Vanadium	2008	—	—	—	—	6	1,200
Gibellini Mn–Ni mine	Nevada Bureau of Geology and Mines	1946	—	—	—	—	4	895.5
	American Vanadium	2007–2008	—	—	7	1,660	—	—
Exploration	American Vanadium	2007–2008	—	—	4	1,300	—	—
Totals			*169*	*25,077*	*95*	*22,142*	*16*	*4,045.5*

Figure 10-1: Drill Hole Location Plan, Gibellini Hill and Louie Hill



Gibellini and Louie Hills Drill Holes

Universal Transverse Mercator - Zone 11 (N) NAD 27
Scale: 1:6,000

Note: Figure courtesy American Vanadium. Drill hole collar identifiers are labelled by company as follows: UC = Union Carbide, C, D, E, F, G, H, I, J, K, L = Atlas drill holes; IG = Inter-Globe drill holes; NG = Noranda drill holes; T = Terteling drill holes; RH, RHC, GcGT, GcM, GIEX, GIV, GIVC, GrAT, GrNT, GrPL= RMP or American Vanadium drill holes,

10.3 Drill Methods

10.3.1 Legacy Programs

Gibellini Hill

Documentation of drilling methods employed by the various operators at Gibellini is sparse. Terteling and Atlas are reported to have used conventional rotary tools (Condon, 1975). NBGM graphic logs note the assay of core samples, but no documentation as to core tool diameter is mentioned.

Noranda (Condon, 1975) reports that the first ten Noranda holes were drilled in 1972, using rotary methods with a vacuum type drill, a probable pre-cursor to the RC drill rig. In 1973, Noranda drilled 42 holes with a reverse circulation Con-Cor rotary rig. The holes were drilled dry with a 4 7/8" diameter long-tooth tricone bit. The Inter-Globe drilling is well documented and employed RC methods with a 5 1/4" diameter tri-cone bit injecting water to control dust. The drill contractor for the Inter-Globe program was Davis Bros. Drilling from Polson, Montana.

RC samples were collected on five foot intervals from all drill campaigns. Many of the Noranda drill holes had no cuttings recovery for the first 5 ft to 10 ft. The water table was noted in some drill logs as occurring at a depth of approximately 200 ft below surface. Cuttings and core recovery was not documented on drill logs other than noting when no sample was returned for a given interval. Several drill logs note the loss of a hole due to poor ground conditions.

Select drill core from the NBGM holes were sampled, typically on one to five foot intervals. No indication of core recovery was noted on the graphic logs.

Most RC holes were drilled to from 50 ft to 350 ft in total length. The average drill hole depth for legacy drill holes on the Project is 207 ft. The deepest legacy drill hole on the property was drilled to 395 ft.

Louie Hill

Union Carbide logs indicate that drilling was completed using rotary drilling methods. All holes are assumed to be vertical, though the inclination and azimuth are not expressly stated.

No information exists for the drill hole sampling conducted by Union Carbide. Drill logs state that drilling was conducted by rotary methods, and this would be consistent with tools available at the time the drilling was completed in the late 1950s. No information on tool size, sample splitting, or sample recovery is available to American Vanadium for this drilling campaign.

10.3.2 RMP/American Vanadium Programs

RC drilling was conducted by Drift Exploration of Elko, Nevada and supervised by Lonny Hafen of RMP. Drilling was performed dry, with water added to suppress dust. Ground water was encountered in several drill holes, but this was reportedly a rare occurrence.

Diamond drilling during 2007–2008 was conducted by Morning Star of Three Forks, Montana, using HQ diameter (2.5 in/6.36 cm) tools. For the 2010 drill programs, O'Keefe Drilling completed all of the RC drill holes using a 5.75" diameter bit. Morning Star Drilling completed the core drilling at HQ diameter.

10.4 Geological Logging

10.4.1 Legacy Programs

Drill holes from the Terteling, Atlas, Noranda, and Inter-Globe drill campaigns were consistently logged for lithology and rock color. Inter-Globe holes were also logged for alteration mineralogy, stain color, and oxide zone (oxidized, transition, un-oxidized). Logs appear consistent within drill campaigns; however differences do occur between campaigns. For instance, Atlas logged 90% of the cuttings from their drilling as shale where Noranda, drilling in essentially the same area, logged 54% of the cuttings as siltstone and 36% as shale. For this reason, correlation of log units is difficult on cross sections displaying both Atlas and Noranda drill holes.

Lithological units for the NBGM drill holes were transcribed from graphic logs.

AMEC transcribed lithological logs into codes for entry in the digital resource database using the convention detailed in Table 10-2. Rock color, alteration mineralogy, stain color, and oxide zone were also transcribed into codes and loaded into the resource database.

The quality of the geological logging of drill holes at Gibellini Hill is variable by campaign. The logs for the Terteling and Atlas campaigns consist of lithology and rock color codes only. Noranda and Inter-Globe logs also contain detailed descriptions of alteration, mineralogy, and redox (oxide–transition–reduced) contacts.

Drill logs, including assays, and a drill hole location map showing the Union Carbide drill holes completed in the late 1950s were recovered by American Vanadium from the son of the former president of Atlas, who had explored the area in the 1960s.

Table 10-2: Lithology Code Convention for Gibellini Drill Holes.

Code	Explanation
1	claystone, mudstone
2	shale
3	silty shale
4	siltstone
5	sandy siltstone
6	silty sandstone
7	sandstone
8	alluvial fill

10.4.2 RMP/American Vanadium Programs

Formation, lithology, alteration, color, structure, and oxidation were logged in Excel spreadsheets for each drill hole of the RMP programs. Lithological logging codes used during the RMP program were included in Table 10-2.

Logging forms also contain the drill hole name, the collar coordinates, the total depth, drill type, hole diameter, and the date drilled. Core recovery and rock mechanics information (fracture density, presence of breccia or shattered zones) were recorded for all core drill holes.

Domaining of the Gibellini Hill deposit is based upon the redox boundaries. Lithology and rock color do not appear to control grade and/or they do not form consistent, mappable, units.

RMP geologists interpreted the position of redox boundaries based upon the lithology, rock color, alteration, mineralogy, and redox contact codes recorded in logs. AMEC considers the domains derived from this interpretation to be adequate and reasonable for this level of study.

10.5 Collar Surveys

10.5.1 Legacy Programs

Collar locations (easting and northing) for the NBGM, Terteling, and Atlas drill campaigns were digitized from a 1:1,200 scale (1” = 100’) Noranda base map showing the previous operators drill hole locations in relation to the Noranda drill holes. Drill hole collar locations are recorded in local units established by Noranda where the grid point 50,000E, 50,000N is located at the section corner of Sections 34 and 35, T16N, R52E MDBM and Sections 2 and 3, T15N, R52E MDBM. Noranda collar locations (easting, northing and elevation) were taken directly from the drill logs. These locations were compared with the digitized locations from the Noranda base map to confirm the accuracy of the map locations.

Because drill hole locations were either digitized from a Noranda drill hole location map or taken directly from the drill logs, there is some uncertainty as to the exact location of the drill holes. No records of the original surveys or survey method remain. AMEC considers the locations to be accurate to ±10 feet. AMEC was able to locate the mine grid in the field and verify the location of several Inter-Globe drill holes using a Global Positioning System (GPS) instrument, but was unable to locate the exact location of Terteling, Atlas, and Noranda drill holes. Drill sites exist in locations as indicated on maps, but monuments or drill casing at these sites were not evident, likely because they were drilled over 30 years ago.

Collar locations for Union Carbide drill holes were collected by American Vanadium drill holes using a hand-held GPS. Collar coordinates on the drill logs are recorded in local grid coordinates; however, American Vanadium geologists surveyed the drill holes in UTM meters using the NAD83 datum.

10.5.2 RMP/American Vanadium Programs

Collar coordinates for the 2007 and 2010 drill holes were obtained in UTM coordinates by RMP personnel using a hand-held GPS unit.

Local grid coordinates for historic drill holes were converted to UTM by RMP by overlaying UTM topography over a local grid topographic map containing the historic drill holes, and digitizing the drill hole coordinates in UTM units using GIS software.

10.6 Down Hole Surveys

10.6.1 Legacy Programs

All Gibellini rotary and RC drill holes were drilled in a vertical orientation. The orientation of Noranda and Inter-Globe drill holes were documented. The orientation of the Terteling and Atlas drill holes were not documented but are assumed to be vertical due to the low dip angle of mineralization. This assumption is supported by the continuity of lithologies and mineralization types between Atlas and other holes, and by results of twin-hole drilling by Inter-Globe. The NBGM core holes were inclined to best intersect known zones of mineralization intersected in the underground workings.

All drill holes making up the Gibellini Hill resource database are relatively short (98% of holes are less than 350 feet in length) and vertical, and so AMEC does not consider the lack of down-hole surveys to be a significant concern. In AMEC's experience, vertical drill holes of 300 feet or less in length are not likely to deviate significantly, in this case, more than 25 feet or the block size being used in the resource model.

Union Carbide logs from Louie Hill indicate that drilling was completed using rotary drilling methods. All holes are assumed to be vertical, though the inclination and azimuth are not expressly stated. Because most Union Carbide drilling is relatively shallow (total depths are generally between 100 feet and 200 feet), the risk of mineralized intercepts being significantly misplaced because of the lack of down-hole surveys is considered by AMEC to be small.

10.6.2 RMP/American Vanadium Programs

All drill holes were drilled in a vertical orientation. None of the holes were surveyed down-hole.

10.7 Recovery

There is no information available on the legacy drilling recoveries.

While ALS Chemex typically reports the weight of samples received at their sample preparation facilities, the sample weights of the Gibellini Project RC samples were not included in the assay certificates provided to RMP.

Core recovery was logged for the five diamond drill holes completed in the Gibellini Hill area. The average recovery from 92 feet to 102 feet was logged as 71 percent.

Generally, core recovery in the oxidized and unoxidized oxidation types was good to fair, where core recovery in the transition oxidation type was generally very good.

In AMEC's opinion, core recovery is generally adequate, averaging 91.6 percent. The fine-grained and diffuse nature of mineralization would favor there being no grade bias caused by poor recovery.

10.8 Sample Length/True Thickness

The RC drill holes completed by RMP in the Gibellini Hill area were designed to confirm the geology, and thickness and grade of vanadium mineralization encountered in historical drilling along the length of the Gibellini Hill deposit.

The geology and thickness of vanadium mineralization in all three drill holes closely matches that expected from previous drilling. Vanadium grades are lower in some cases, and higher in other cases.

During the drilling at Louie Hill in 2007, significant thicknesses of vanadium mineralization were encountered in all three drill holes, comparable in thickness and grade to the oxide zone at Gibellini Hill. Higher grade vanadium mineralization, like that of the transition zone at Gibellini Hill, was not encountered at Louie Hill, except for at the surface in the northernmost drill hole

Mineralized zones at Gibellini Hill and Louie Hill are irregular in shape but generally conform to the stratigraphy of the host shales, modified somewhat by post-mineral oxidation and supergene enrichment. The stratigraphy dips at low angles to the west and so vertical intersections of mineralization are roughly approximate to the true mineralized thickness.

Mineralization at Gibellini Hill is roughly stratabound, strikes northwest–southeast and dips at low angles to the west. The mineralization is parallel to the orientation of the main ridge in the vanadium mineral resource area.

Mineralization at Louie Hill is also stratabound, strikes north-south, and dips at very low angles to the west.

Table 10-3 presents an example of the types of drill intercepts that have been returned for the Project deposit areas in the legacy drill programs. Table 10-4 shows example intercepts from the American Vanadium and RMP drill programs.

Drill hole orientations are indicated on the cross-sections included in Section 7 of this Report.

Table 10-3: Example Drill Intercepts, Legacy Programs

Deposit	Hole ID	From (ft)	To (ft)	Intercept (true width ft)	Average Grade (% V_2O_5)
Gibellini Hill	C-9	5	25	20	0.24
	D-7	5	25	20	0.29
	D-8	130	160	30	0.20
	D-8	185	195	10	0.24
	D-8	5	105	100	0.41
	E-10	200	205	5	0.11
	E-10	245	260	15	0.25
	E-10	0	190	190	0.29
	F-3	10	40	30	0.39
	G-9	215	280	65	0.23
	G-9	5	160	155	0.33
	H-10	165	170	5	0.18
	H-10	200	285	85	0.26
	H-10	0	110	110	0.28
	I-6	95	155	60	0.28
	I-6	0	75	75	0.31
	IG-1	0	120	120	0.60
	IG-10	0	225	225	0.32
	IG-11	0	90	90	0.25
	J-10	65	85	20	0.16
	J-10	0	50	50	0.22
	K-5	0	40	40	0.23
	NG-10	215	245	30	0.17
	NG-10	100	120	20	0.18
	NG-10	125	200	75	0.26
	NG-10	0	80	80	0.30
	NG-13	180	184	4	0.15
	NG-13	165	175	10	0.17
	NG-13	10	155	145	0.38
	NG-14	320	350	30	0.23
	NG-14	10	300	290	0.25
	NG-45	5	45	40	0.29
	NG-45	105	165	60	0.31
	T-12	95	100	5	0.14
	T-12	105	130	25	0.17
	T-12	8	60	52	0.26
	T-12	65	90	25	0.29
	T-2	5	180	175	0.43
	T-20	5	155	150	0.49
	T-21	0	10	10	0.32
	T-21	25	155	130	0.42
	T-22	65	110	45	0.26
	T-22	5	50	45	0.44

Deposit	Hole ID	From (ft)	To (ft)	Intercept (true width ft)	Average Grade (% V_2O_5)
	T-26	5	140	135	0.34
	T-40	5	150	145	0.33
	T-41	0	150	150	0.47
Louie Hill					

Legacy Drill Hole Prefix Key: C, D, E, F, G, J, K, L = Atlas drill holes; IG = Inter-Globe drill holes; NG = Noranda drill holes; T = Terteling drill holes

Table 10-4: Example Drill Intercepts, RMP and American Vanadium Programs

Deposit	Hole ID	Intercept (ft from–to)	True Width (ft)	Average Grade (% V2O5)
Gibellini Hill	GIVC-5	7–83	76	0.32
		98–143	45	0.22
		148–173	25	0.24
		188–212	24	0.25
Louie Hill	RHC-1	7–43	36	0.24
		53–200	147	0.26
	RHC-2	7–106	99	0.19
	RHC-3	10–37	27	0.54
	RHC-4	13–53	40	0.15
	RHC-5	7–56	49	0.16
	RHC-6	7–78	71	0.25
		78–144	66	0.78

10.9 Geotechnical and Hydrological Drilling

10.9.1 Project Site Investigations

Site-wide geotechnical drilling was performed with a number of objectives, including:

- Characterize and evaluate the subsurface soil and groundwater conditions at the proposed heap leach facility, pond and process plant area, related surface facilities areas, waste dump area, and access road
- Evaluate potential borrow source materials and locations
- Provide preliminary foundation recommendations for the plant and other surface facilities
- Identify seismic hazards.

To characterize and evaluate the existing soil and groundwater conditions at the site, multiple test pits were excavated and seven exploratory borings were completed to depths of 45.5 to 101 feet below existing grade. In general, soils encountered during the investigation in the proposed heap leach pad, plant site, waste dump and access road areas typically consist of poorly graded silty and clayey gravels with sand, clayey sands and silty sands with gravels and some cobbles and boulders to the depth explored. Surface soils containing abundant root and rootlets were encountered in all borings and test pits with an average thickness of approximately one foot. Clear and grubbing of at least one foot is recommended within the leach pad and pond areas. Groundwater was not encountered to the maximum depth penetrated of 101 feet during the site investigation.

AMEC completed a feasibility-level borrow source investigation to identify material suitable for use in constructing and operating the project. The borrow source investigation focused on identifying three primary material types:

1. A durable non-acid buffering overliner material
2. A durable material source for use in manufacturing rip-rap, roadway bedding and surfacing, and drain rock
3. A low permeability underliner material.

Two potential sources were evaluated for suitability for overliner material including agglomerated vanadium ore, and rhyolite obtained from nearby American Vanadium-controlled mining claims. Based upon fixed wall permeability testing conducted on remolded samples of agglomerated ore, lower than acceptable hydraulic conductivity results were obtained; thus, eliminating agglomerated ores as an overliner source. Results of the permeability testing indicate that the materials from the rhyolite borrow source are suitable for use as overliner material provided the material is crushed and or screened to provide the required gradation.

The rhyolite borrow source has also been selected as the preferred source for manufacturing rip-rap, roadway bedding and surfacing, and drain rock.

Based upon the results of the feasibility level borrow source investigation and the lack of locally available suitable materials for underliner, an alternative underliner option of using a geosynthetic clay liner (GCL) was developed for the feasibility design.

A seismic hazard analysis for the Gibellini Project site was completed as part of the study. This included the development of feasibility level design ground motions associated with the maximum credible earthquake (MCE) and the operating basis earthquake (OBE). The ground motions for the MCE were estimated using a deterministic approach and the ground motions for the OBE were estimated using a probabilistic approach.

10.9.2 Open Pit Investigations

Five vertical and four oriented drill holes (1,011 feet) were completed in the area of the planned open pit using using wireline triple tube diamond drill core (HQ core size). Rock mass ratings indicate that the majority of rock units encountered (siltstone, mudstone, chert) were of poor rock quality and can be classified as either extremely weak rock or stiff soil. Dolomite and limestone were encountered and are estimated to be of fair rock quality, although limited information is available for these units from the geotechnical drilling.

Exploration drilling did not indicate groundwater within the anticipated limits of the proposed pit configuration. Consequently, as the proposed pit is approximately less than 200 feet deep, groundwater pressurization may be low or non-existent in large portions of the pit, however, either perched or actual groundwater may exist within the anticipated profile of the pit excavation. Therefore, for the purposes of the Feasibility Study, it was assumed that any adverse groundwater pressures encountered during mining will be remediated through dewatering, so that the slope was assumed to be effectively dry.

Locations of the geotechnical drilling on the Project site are included in Figure 10-2. Drill holes completed within the proposed pit area are included as Figure 10-3.

10.10 Metallurgical Drilling

A program of metallurgical drilling was performed in 2010. Drill hole locations within the pit shell constraint designed during the earlier PA study are indicated in Figure 10-5.

10.11 Facilities Condemnation Drilling

RMP drilled six RC drill holes with a total footage of 1,400 feet at the proposed heap leach site 1.5 miles east of the Gibellini Hill Deposit. Three, 200 foot, holes were drilled along the north edge of the heap leach, a 600 foot drill hole was sited in the center of the heap leach and two, 200 foot, drill holes at each of the respective south corners of the heap leach. Geology consists of Quaternary alluvium of interbedded coarse conglomerate, medium to coarse sandstone and claystone. The water table was not encountered in the drill. No anomalous vanadium assays were encountered.

Figure 10-2: Geotechnical Bore Hole and Test Pit Locations

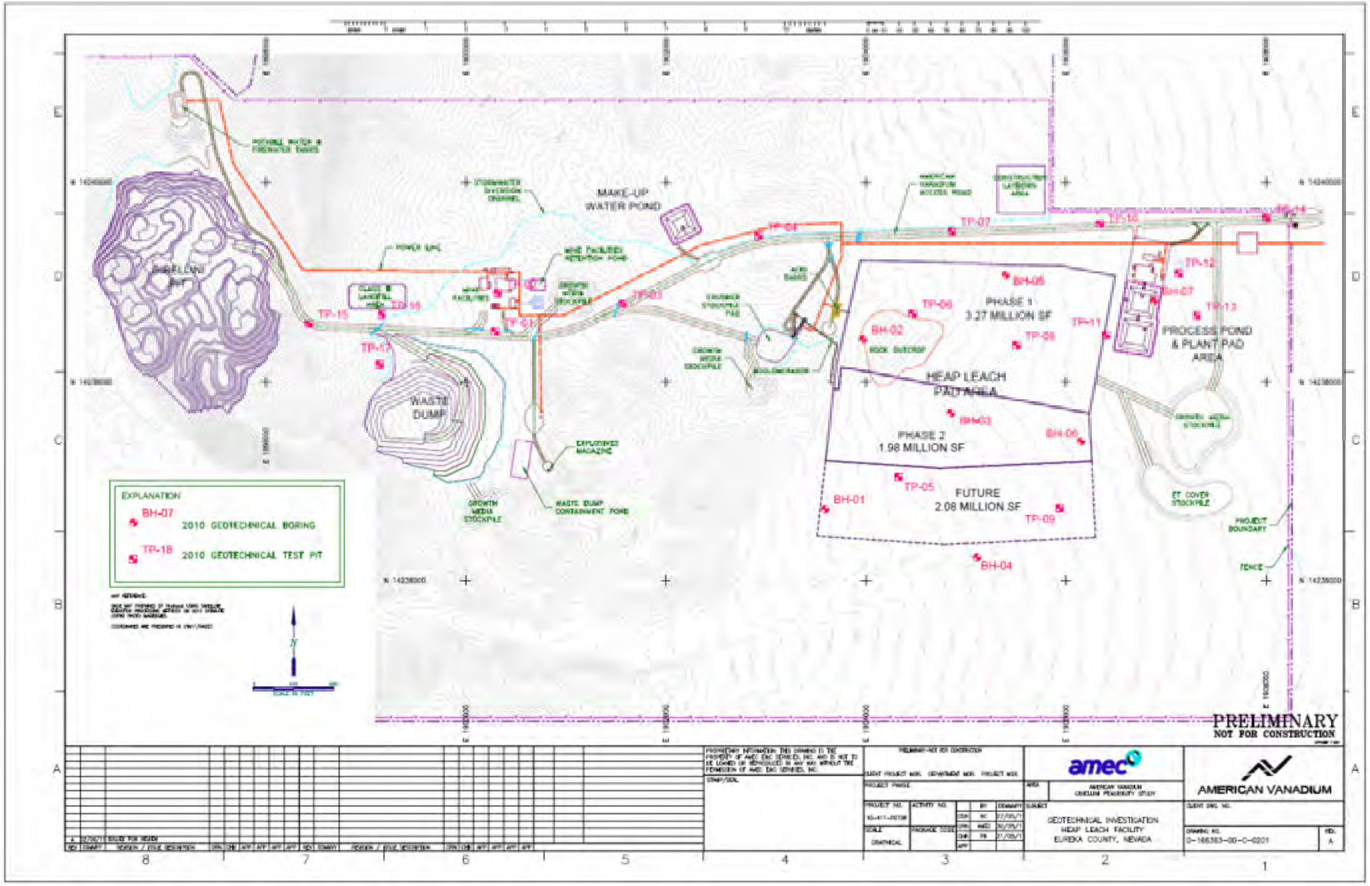


Figure 10-3: Location Plan, Geotechnical Drill Holes within Pit Design

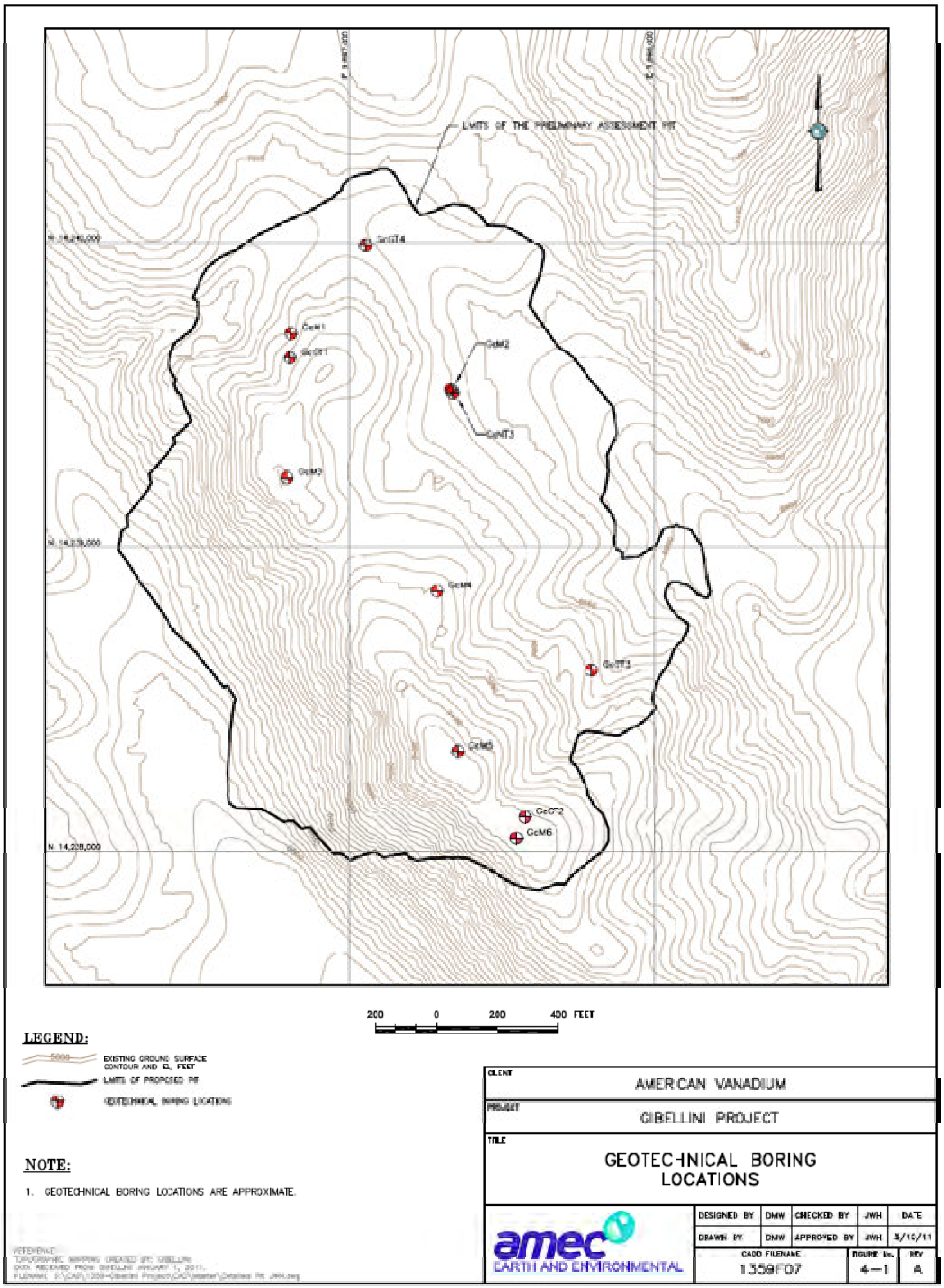
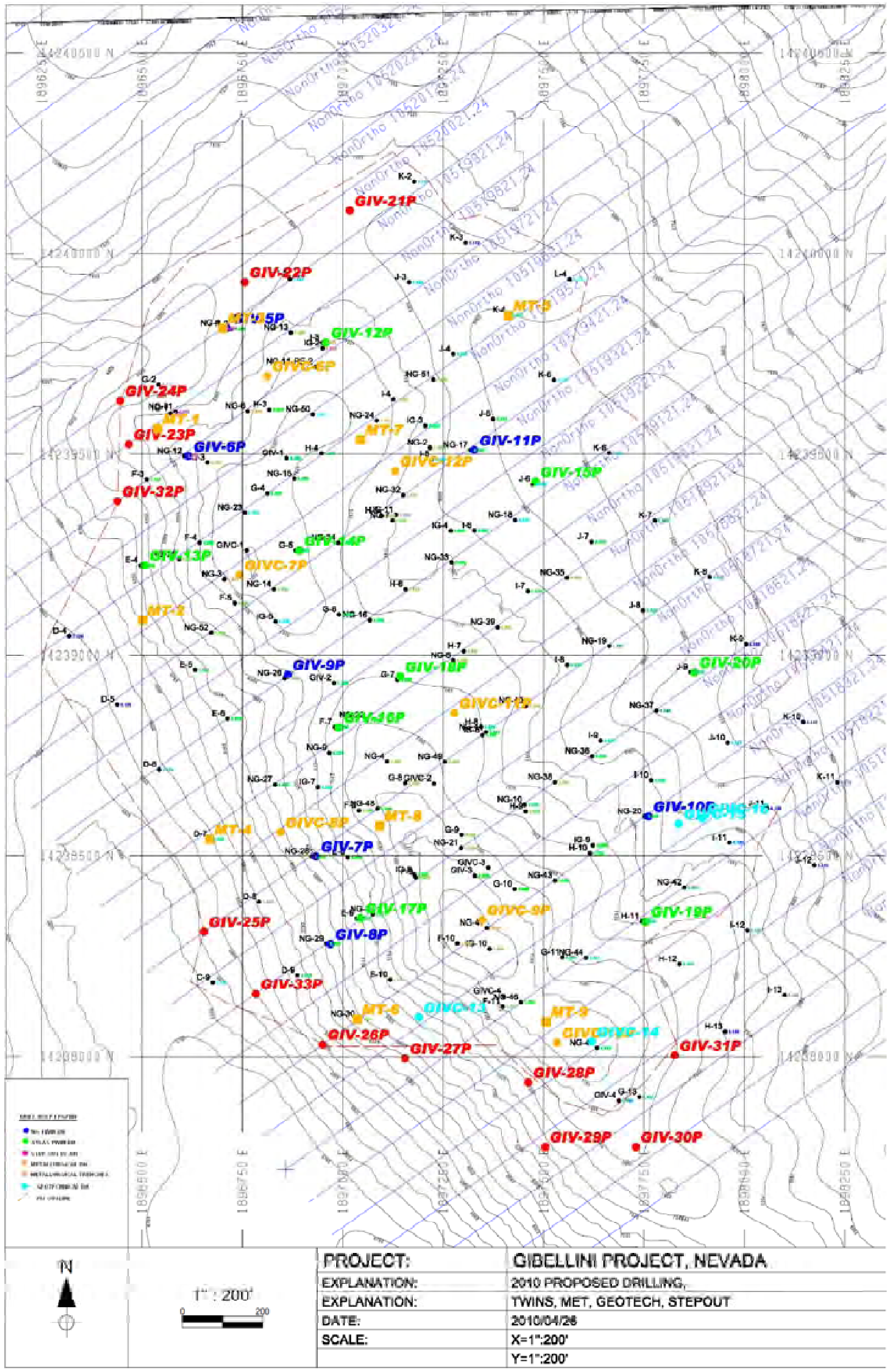


Figure 10-4: Metallurgical Drill Hole Location Plan



10.12 Comments on Section 10

In the opinion of the QPs, the quantity and quality of the lithological, geotechnical, collar and downhole survey data collected in the exploration and infill drill programs completed by RMP and American Vanadium, and the verification performed by American Vanadium on legacy drill data are sufficient to support Mineral Resource and Mineral Reserve estimation as follows:

- RC chip and core logging meets industry standards for exploration of an oxide vanadium deposit
- Collar surveys and re-surveys of legacy drill hole collar locations have been performed using industry-standard instrumentation
- No down hole surveys were performed. AMEC does not consider the lack of down-hole surveys to be a significant concern. In AMEC's experience, vertical drill holes of 300 feet or less in length are not likely to deviate significantly, in this case, more than 25 feet or the block size being used in the resource model.
- Recovery data from RMP and American Vanadium RC and core drill programs are acceptable
- Geotechnical logging of drill core meets industry standards for planned open pit operations
- Drill orientations are generally appropriate for the mineralization style, and have been drilled at orientations that are optimal for the orientation of mineralization for the bulk of the deposit area
- Drill orientations are shown in the example cross-sections included in Section 7, and can be seen to appropriately test the mineralization
- Drill hole intercepts as summarized in Table 10-3 appropriately reflect the nature of the vanadium mineralization encountered in both the legacy and the RMP/American Vanadium drill programs. The table demonstrates that sampling is representative of the vanadium oxide grades in the deposits, reflecting areas of higher and lower grades
- No material factors were identified with the data collection from the drill programs that could affect Mineral Resource or Mineral Reserve estimation.

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Legacy Reverse Circulation Sampling

Noranda collected samples continuously over five foot intervals in a cyclone collector (Condon, 1975). Dust loss was reported to be minimal. Samples were split with a Gilson splitter and the rejects were stored for possible metallurgical testing. Color, texture, and other diagnostic features were logged. The average weight of 1,138 samples reported by the assay laboratory for Noranda samples was 59 pounds.

Inter-Globe collected one to five pounds of material for assay on five foot intervals. Dust lost was minimized by the use of water in drilling. All cuttings were directed from the cyclone into one to three, five gallon buckets, from which samples for assay and samples for metallurgical tests were collected. Samples were split using a Jones riffle splitter. Metallurgical samples were also collected for each interval. The cyclone and splitter were cleaned manually and with compressed air between intervals.

AMEC evaluated rotary and RC drill holes for evidence of down-hole contamination in the form of asymmetric grade decay down-hole or spikes in grade at cyclical intervals. Analyses revealed evidence of possible down-hole contamination in one Atlas drill hole and one Noranda drill hole below intercepts of greater than 1.0% V_2O_5, but AMEC concluded that the width and grade of the possible contamination was not significant enough to warrant adjusting grades assigned to the intervals.

Comparison of RC drill holes with nearby rotary drill holes (less than 20’ collar separation) found that there was no evidence of significant down-hole contamination in the rotary holes.

11.2 RMP Reverse Circulation Sampling

Cuttings for each interval were collected in five gallon buckets and split manually, using a riffle splitter. A split (½ of the material from the interval) of the material was bagged for assaying and the remaining material was bagged for archive purposes. Where ground water was encountered, a wet splitter was placed below the cyclone.

A small portion of the cuttings for each interval was retained in a plastic container (RC chip tray) for logging purposes. RC samples were collected in five foot intervals.

Sample bags were labeled with sequential sample numbers. Sample bags were transported each day by RMP or drill personnel to the RMP office in Eureka and stored in a secure layout area until ready for dispatch to the assay laboratory. Trucks from

ALS Chemex, either from the Winnemucca or Elko sample preparation facilities, picked up samples at the RMP Eureka office.

11.3 RMP Core Sampling

Drill core was transported by RMP personnel to the RMP office in Eureka and stacked in a secure layout area. There, core was photographed, logged, and prepared for shipment to Dawson Laboratories for metallurgical test work. Selective six inch intervals were removed and sent to ALS Chemex for determination of specific gravity. These intervals were selected to be representative of the oxidation types encountered during drilling. There is some risk that the intervals selected may be more competent than the remaining drill core, and may overestimate the density of the deposit.

Core was sampled on nominal five foot intervals, with a minimum of one foot and a maximum of nine feet. The average is 4.5 feet.

11.4 Metallurgical Sampling

Trench samples were collected as bulk samples from the field. Drill core for the 2010 metallurgical testwork programs was supplied as whole core intervals from selected drill holes. Drill core prior to 2010 used in metallurgical testwork was half-core, from selected drill holes.

11.5 Density Determinations

A total of 63 core intervals from the 2007 drilling campaign at Gibellini Hill were submitted by RMP for determination of specific gravity. Intervals were selected from four core drill holes so as to be representative of the major oxidation zones. Six inch intervals of whole core were sent to ALS Chemex in Reno, Nevada for determination of dry bulk density by the wax coated water immersion method (ALS Chemex procedure OA-GRA08a).

Specific gravity values were partitioned by oxidation type and average values were computed (Table 11-1). These average values were used to calculate tonnage in the mineral resource model.

AMEC used the oxide density data from Gibellini Hill deposit to define density within the Louie Hill model. AMEC recommends that for density at Louie Hill a minimum of 30 density determination be collected per rock type and alteration type, and that the samples are spatially representative of the deposit from surface to the base and spread over the lateral extent of the deposit. These data should then be used to define density in the Louie Hill block model.

Table 11-1: Summary of Gibellini Density Data

	N	Mean	SD	CV
Oxidized	35	1.90	0.24	0.13
Transition	51	1.96	0.27	0.14
Reduced	36	2.26	0.20	0.09

11.6 Analytical and Test Laboratories

The RMP and American Vanadium core and RC samples were analysed by ALS Chemex, a well-established and recognized assay and geochemical analytical services company. The Sparks (Reno) laboratory of ALS Chemex is ISO 9002-registered; the Vancouver laboratory holds ISO17025 accreditation.

11.7 Sample Preparation and Analysis, Legacy Drill Programs

11.7.1 NBGM

Manganese, nickel, and zinc assays for NBGM drill holes were transcribed by AMEC from graphic drill logs. The original assay certificates are not available from this drill campaign. Neither the assay laboratory name nor the sample preparation or assay methodology is noted on the logs. No evidence of a QA/QC program is noted on the logs either.

11.7.2 Terteling

The V_2O_5 assays for Terteling drill holes were transcribed by AMEC from typewritten drill logs. The original assay certificates are not available from this drill campaign. Neither the assay laboratory name nor the sample preparation or assay methodology is noted on the logs. No evidence of a QA/QC program is noted on the logs either.

AMEC compared Terteling assays to assays from Inter-Globe drill holes that were within 20 feet of the Terteling drill holes and found the Terteling assays to be consistently biased high. Inter-Globe V_2O_5 assays contained adequate QA/QC controls and are considered to be acceptably accurate and precise (see Section 13.5) and so AMEC considers comparison against Inter-Globe assays to be an acceptable indicator of assay accuracy. For five drill holes compared (15% of campaign), the average grade of Terteling assays from the mineralized intervals were between 29% and 73% higher than the comparable Inter-Globe assays, with an average difference of 43% higher. The mineralized intervals were, on average, 4% shorter for Terteling drill holes.

11.7.3 Atlas

V_2O_5 assays for Atlas drill holes were transcribed by AMEC from typewritten drill logs. The original assay certificates are not available from this drill campaign. Neither the assay laboratory name nor the sample preparation or assay methodology is noted on the logs. No evidence of a QA/QC program is noted on the logs either.

Comparison of Atlas assays to assays from Inter-Globe drill holes that were within 20 feet of the Atlas drill holes indicated that the Atlas assays were comparable. For four drill holes compared (5% of campaign), Atlas assays were between 14% lower to 18% higher than the comparable Inter-Globe assays, with an average difference of 2% lower. The mineralized intervals were also equivalent, with the total length of the Atlas mineralized intervals equal to 1,105 feet and the total length of the Inter-Globe intervals equal to 1,110 feet.

11.7.4 Noranda

V_2O_5 assays for Noranda drill holes NG-1 to NG-10 were performed by Union Assay Office Inc. (Union) using a direct titration procedure on a 2 g sub-sample. The sample was oxidized with nitric acid and potassium perchlorate, digested with hydrochloric and hydrofluoric acids, then fumed strongly with sulphuric acid. The filtered solution was then oxidized with potassium permanganate solution and reduced by repeated boiling with hydrochloric acid.

Check assays for all samples for these holes were performed by the Colorado School of Mines Research Institute (CSMRI) in Golden, Colorado and by Noranda's in-house laboratory using similar, but slightly different, procedures. AMEC plotted the check assays against the original assays and found that the Union assays are biased marginally (9% to 14%) high compared to CSMRI and Noranda check assays.

Noranda recognized this bias and conducted a study after the initial drill program to determine the source of the bias and to determine the optimum analytical method for V_2O_5. In this study, analytical results for the laboratories were compared on three head-grade samples and three tail-grade samples from the Gibellini Hill deposit (Noranda, 1973). Noranda concluded that the laboratories were reporting essentially equivalent results, but recommended that all samples be fused in sodium peroxide to ensure complete dissolution and oxidation of vanadium prior to analysis. This recommendation was carried out for the remainder of the assaying of Noranda samples.

V_2O_5 assays for Noranda drill holes NG-11 to NG-52 were performed at CSMRI using sodium peroxide fusion and colorimetry as recommended by Dr. Kerbyson of the Noranda Research Centre (Condon, 1975). Sample preparation procedures are not documented. AMEC attempted to contact CSMRI for more information, but found that CSMRI has been defunct for 20 years and that no information remains from the Noranda assays (Dr. L.G. Closs, personal communication).

Comparison of Inter-Globe drill holes within 20 feet of Noranda drill holes found the average length and grade of mineralized intervals to be equivalent. The total length of the mineralized intercepts from three Noranda drill holes (6% of campaign) was 370 feet and the average grade was 0.30% V_2O_5, where the total length of the nearby Inter-Globe holes was 385 feet and the average grade was 0.30%.

11.7.5 Inter-Globe

Inter-Globe assayed samples for V_2O_5 at Skyline Laboratories (Skyline) in Denver, Colorado. The original assay certificates are not available from this drill campaign; however, JAA (1989a) describes the sample preparation and assay methodology. Approximately five pounds of drill cuttings were dried as necessary, split in a riffle splitter to generate a 150 g sub-sample, and pulverized in a ring mill (size and percent passing not noted). A 0.1 g aliquot of the pulverized sample was dissolved in hydrofluoric, nitric, and perchloric acids, taken to dryness, diluted in hydrochloric acid, diluted to 5% hydrochloric acid and measured on an inductively coupled argon plasma spectrometer (ICP-ES).

About 15% of the samples were assayed in duplicate by Skyline and sent for check assay at Bondar Clegg (Bondar) in Denver, Colorado. Bondar assayed V_2O_5 by four-acid digestion (hydrofluoric, nitric, perchloric, hydrochloric) on a 0.5 g sample followed by atomic absorption spectrometry.

AMEC contacted Skyline for more information on the assay method used, but was told that no information remains from the Inter-Globe assays. The Bondar Clegg company no longer exists.

AMEC plotted Bondar Clegg check assays against the Skyline original assays to determine the accuracy of the Skyline V_2O_5 assays and found them to be acceptable. AMEC also plotted Skyline duplicates to determine the precision of the Skyline V_2O_5 assays and found them to be acceptable.

11.7.6 Union Carbide

No information is available to American Vanadium concerning the sample preparation and assaying methods employed for the Union Carbide drill campaign. Assays in V_2O_5 (assumed to be in units of percent) are hand entered into the drill logs opposite the drill interval. Where sample numbers are also noted, no information regarding assay laboratory or assay methodology is present.

11.7.7 RMP and American Vanadium

All 2007–2008 drill samples were submitted to ALS Chemex in Winnemucca or Elko Nevada for sample preparation. Assays were performed at the ALS Chemex laboratories in Reno, Nevada and Vancouver, Canada.

Samples were weighed, dried, and crushed to 70% passing 2 mm. A nominal 250 g split was then taken, and pulverized to 85% passing 75 µm.

Vanadium was determined by four-acid digestion on a 2.0 g subsample and ICP-AES finish (ALS Chemex procedure code ME-ICP61a). The lower detection limit for vanadium by this method is 10 ppm. An additional 32 elements are reported from this procedure, including zinc. Gold, platinum, and palladium were determined by standard fire assay on a 30 g subsample (ALS Chemex code PGM-ICP23). Select samples were assayed for uranium and selenium concentrations by XRF (ALS Chemex procedure code ME-XRF05).

Specific gravity was determined by ALS Chemex on whole core samples using the wax-coated water immersion method (ALS Chemex procedure code OA-GRA08A).

Sample preparation and assaying procedures for the 2010 drill campaigns were unchanged from those used during 2007–2008.

11.8 Quality Assurance and Quality Control

11.8.1 Legacy Data in Database

AMEC digitized existing legacy drill hole locations, surveys, logs and assays from paper maps, logs, and assay certificates to generate the Gibellini Hill database. AMEC assembled all the data into a series of database tables (collar, survey, lithology, assay, and redox) in Access®. Prior to the creation of the Access® database, all drill information was in paper format.

AMEC digitized drill hole collar locations in local grid coordinates for the Terteling, Atlas, and Noranda drill campaigns from a 1:1200 scale base map generated by Noranda. The accuracy of these collar locations is estimated to be ±10 feet. Noranda and Inter-Globe drill hole coordinates were taken from the drill logs. Noranda collar locations were compared with the digitized coordinates and where the drill log and digitized coordinates did not agree within 10 feet in easting or northing, the base map was consulted and the digitized coordinates were used (NG-8, NG-9, NG-28, and NG-45). NBGM drill hole coordinates were taken from 1:1,200 scale drill hole location maps. Underground workings at the Gibellini manganese–nickel mine (channel sampled by NBGM) were digitized and entered into the database as ‘pseudo-drill holes’.

Assays for the Terteling and Atlas drill campaigns were entered from typed drill logs; the original assay certificates are no longer available from these campaigns. The assays for the Noranda drill holes were entered from both original assay certificates and drill logs. Assays for Inter-Globe drill holes were entered from compiled assay tabulations found in Appendix D of JAA (1989a). Assays for NBGM drill holes were entered from original assay certificates.

AMEC entered V_2O_5 assays using a double-data-entry system. Assays were entered into two separate spreadsheets by separate operators. The two data sets were then compared by a third operator and all matching values were entered into the assay table. Assay values not matching were checked against the original certificates or logs, corrected, and loaded into the assay database.

Drill logs for the Noranda and Inter-Globe drill holes were evaluated by an AMEC geologist, transcribed into appropriate codes, and loaded into the Lithology table. Redox boundaries for all drill holes were interpreted from logs by RMP geologists and loaded into the redox table.

All Noranda and Inter-Globe drill holes were drilled in a vertical orientation and so AMEC entered vertical orientations (azimuth = 0 and inclination = -90) for the collar (0 feet) and total depth positions in the Survey table. Terteling and Atlas drill holes were assumed to be vertical and were also given vertical orientations in the Survey table. NBGM drill hole orientations were noted on the maps and were digitized by AMEC accordingly. Underground working traces were digitized by AMEC and are approximations at best. Surveying of these workings to give them accurate three dimensional coordinates relative to other assay information in the area will be required should the information be required to support additional work programs.

AMEC conducted data integrity checks of the Gibellini Project digital database (checking for overlapping intervals, data beyond total depth of hole, unit conversion, etc.) and concludes that the resource database is reasonably error-free and acceptable for use in resource estimation.

AMEC exported separate collar, survey, lithology and assay files for import into MineSight® for subsequent geological modeling and resource estimation.

Inter-Globe V_2O_5 assays were found to be accurate and precise based upon check assays and duplicates included in the QA/QC program for the drill campaign (Section 13.5). AMEC considers these assays to be acceptable for use in resource estimation, but because no original assay certificates remain from this campaign, AMEC recommends that blocks affected by Inter-Globe assays be assigned a maximum classification of Indicated Mineral Resources.

Inter-Globe V_2O_5 assays from nearby drill holes provide a check of assay accuracy for the Terteling, Atlas, and Noranda assays. No evidence of a QA/QC program was encountered for the Terteling or Atlas campaigns. No evidence of a QA/QC program was encountered for Noranda drill holes NG-11 to NG-52. Inter-Globe assays are considered accurate and comparing grades in nearby drill holes provides a check of the assay accuracy for these holes.

Terteling V_2O_5 assays were found to be biased high an average of 43% relative to Inter-Globe based upon a comparison of mineralized intervals from nearby holes. AMEC recommends that the Terteling drill holes not be used for resource estimation. Because the Terteling drill pattern is adequately covered by both Atlas and Noranda drilling (refer to Figure 11-2), the impact of not using these holes is minimal regarding adequate drill spacing throughout the deposit.

Atlas V_2O_5 assays were found to be comparable to Inter-Globe assays based upon a comparison of mineralized intervals from nearby holes. However, because the original certificates are not available, the assay laboratory and analytical method are not known, and drill collars cannot be confirmed, the lower confidence in these data require that resources estimated with the Noranda data be classified as no better than Inferred Mineral Resources. Because the Atlas drill pattern is covered by the Noranda drill pattern through the main resource area (Figure 11-1), the impact of assessing a lower classification to blocks affected by Atlas holes is mainly on the fringes of the deposit.

Noranda V_2O_5 assays were also found to be comparable to Inter-Globe assays based upon a comparison of mineralized intervals from nearby holes. Noranda drill holes NG-1 to NG-10 were part of several QA/QC programs which showed that, although the original assays were biased marginally high compared to the check assay laboratories, the procedure used likely produced low-biased data compared to the best assay procedure for V_2O_5, which was used for Noranda drill holes NG-11 to NG-52. AMEC considers the Noranda assays acceptable for use in resource estimation, but because of the uncertainty in the assays, AMEC recommends that blocks affected by Noranda assays have a maximum classification of Indicated Mineral Resources.

AMEC collected five samples on the Gibellini vanadium deposit from trenches that were previously sampled by Inter-Globe (JAA, 1989b). One sample was collected from trench #4, two samples were collected from trench #8, and two samples were collected from trench #9. Trench samples were collected as horizontal or vertical channels according to the original sampling method. AMEC was unable to duplicate exactly the Inter-Globe sample locations because the sample markers from the sampling carried out 19 years previously were mostly missing or illegible. Samples were assayed for vanadium by ALS Chemex in Reno, Nevada by a four-acid digestion, ICP determination.

AMEC sampling generally returned V_2O_5 assays of economic grade and in the range expected from Inter-Globe sampling, but the grades are generally lower than Inter-Globe, especially from trench #9. AMEC submitted one standard reference material (SRM) sample with the sample submittal that returned an acceptable result and so considers the ALS Chemex V_2O_5 assay values to be accurate.

The trench assays are not part of the mineral resource model and so the uncertainty in the accuracy of these assays poses no risk to the current mineral resource estimate. No QA/QC program was reported to have been included in the Inter-Globe trench program. AMEC recommends that confirmation sampling of the trenches be completed by RMP prior to any consideration of inclusion of the trench data for mineral resource estimation. No material from drill samples making up the resource database remains, therefore AMEC was unable to independently verify these assays with check assays.

11.8.2 RMP and American Vanadium

Standard reference materials (SRMs), blanks, and duplicates were inserted by RMP with routine drill samples during the 2007–2008 and 2010 drill programs to control assay accuracy and precision.

Evaluation of this work is presented in Section 12 of this Report.

11.9 Databases

Drill data collected from geological logging are currently stored in an Access® database. This database is stored on the American Vanadium server in Reno, Nevada. Legacy drill data, in paper format, are stored in the American Vanadium offices at Reno, Nevada.

Geological data from the RMP and American Vanadium programs are collected in Excel® format, and subsequently uploaded to the Access® database. Collar survey data are recorded as part of the geological data. Analytical data are supplied in digital (CSV) format by ALS Chemex and loaded into the Access® database. Assay certificates are supplied in PDF® format and are stored in American Vanadium's Reno office.

11.10 Sample Security

Sample security procedures for legacy drilling at the Gibellini Project are unknown.

RMP drill samples were transported each day by RMP or drill personnel to the RMP office in Eureka and stored in a secure layout area until ready for dispatch to the assay laboratory. Trucks from ALS Chemex, either from the Winnemucca or Elko sample preparation facilities, picked up samples at the RMP Eureka office. A similar procedure was followed for the 2010 American Vanadium program.

RMP and American Vanadium remaining core, RC reject material, and returned assay pulps are stored in the secure layout area in Eureka.

11.11 Comments on Section 11

The QPs are of the opinion that the quality of the gold, copper, and molybdenum analytical data are sufficiently reliable (also see discussion in Section 12) to support Mineral Resource and Mineral Reserve estimation for vanadium, and that sample preparation, analysis, and security are generally performed in accordance with exploration best practices and industry standards as follows:

- Documentation of drilling methods employed by the various legacy operators is sparse. No cuttings, assay rejects, or pulps remain from these drilling campaigns
- All legacy data in the Gibellini Project resource database were entered by AMEC and accurately represent the source documents

- No records remain for the drill sampling methods employed by NBGM (core), Terteling (rotary), or Atlas (rotary). Noranda and Inter-Globe collected drill samples on five foot intervals
- RC and core methods sampling employed by RMP and American Vanadium are in line with industry norms. RMP collected RC samples as five foot intervals. Core was sampled by RMP and American Vanadium on nominal five-foot intervals, with a minimum of one foot and a maximum of nine feet
- Drill sampling has been adequately spaced to first define, then infill, vanadium anomalies to produce prospect-scale and deposit-scale drill data. Drill hole spacing varies with depth. Drill hole spacing increases with depth as the number of holes decrease and holes deviate apart, and is more widely-spaced on the edges of the Gibellini Hill and Louie Hill deposits
- Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure for the RMP and American Vanadium drill programs
- For portions of the legacy data, the names of the laboratories that performed the assays are known; however, no information is available as to the credentials of the analytical laboratories used for the drill campaigns prior to the RMP drilling
- The RMP and American Vanadium core and RC samples were analysed by reputable independent, accredited laboratories using analytical methods appropriate to the vanadium concentration.

12.0 DATA VERIFICATION

AMEC has performed two data verification exercises, one in 2008, and a second during 2011, in support of technical reports on the Project.

12.1 2008 Verification Program

12.1.1 Legacy Data Review

All legacy data in the Gibellini Project resource database were entered by AMEC and accurately represent the source documents. Data quality of the surveys, assays, and geology were reviewed as follows:

- AMEC was able to locate the mine grid in the field and verify the location of several Inter-Globe drill holes using a Global Positioning System (GPS) instrument, but was unable to locate the exact location of Terteling, Atlas, and Noranda drill holes
- All drill holes making up the Gibellini Project resource database are relatively short (98% of holes are less than 350 feet in length) and vertical, and so AMEC does not consider the lack of down-hole surveys to be a significant concern
- AMEC conducted data integrity checks of the Gibellini Project digital database (checking for overlapping intervals, data beyond total depth of hole, unit conversion, etc.) and concluded that the resource database is reasonably error-free and acceptable for use in Mineral Resource estimation
- Inter-Globe V_2O_5 assays were found to be accurate and precise based upon check assays and duplicates included in the QA/QC program for the drill campaign (Section 13.5). AMEC considers these assays to be acceptable for use in resource estimation, but because no original assay certificates remain from this campaign, AMEC recommends that blocks affected by Inter-Globe assays be assigned a maximum classification of Indicated Mineral Resources
- Inter-Globe V_2O_5 assays from nearby drill holes provide a check of assay accuracy for the Terteling, Atlas, and Noranda assays. No evidence of a QA/QC program was encountered for the Terteling or Atlas campaigns. No evidence of a QA/QC program was encountered for Noranda drill holes NG-11 to NG-52. Inter-Globe assays are considered accurate and comparing grades in nearby drill holes provides a check of the assay accuracy for these holes
- Terteling V_2O_5 assays were found to be biased high an average of 43% relative to Inter-Globe based upon a comparison of mineralized intervals from nearby holes. AMEC recommends that the Terteling drill holes not be used for resource estimation. Because the Terteling drill pattern is adequately covered by both Atlas

and Noranda drilling, the impact of not using these holes is minimal regarding adequate drill spacing throughout the deposit

- Atlas V_2O_5 assays were found to be comparable to Inter-Globe assays based upon a comparison of mineralized intervals from nearby holes. However, because the original certificates are not available, the assay laboratory and analytical method are not known, and drill collars cannot be confirmed, the lower confidence in these data require that resources estimated with the Noranda data be classified as no better than Inferred Mineral Resources. Because the Atlas drill pattern is covered by the Noranda drill pattern through the main Gibellini Hill resource area, the impact of assessing a lower classification to blocks affected by Atlas holes is mainly on the fringes of the deposit
- Noranda V_2O_5 assays were also found to be comparable to Inter-Globe assays based upon a comparison of mineralized intervals from nearby holes. Noranda drill holes NG-1 to NG-10 were part of several QA/QC programs which showed that, although the original assays were biased marginally high compared to the check assay laboratories, the procedure used likely produced low-biased data compared to the best assay procedure for V_2O_5, which was used for Noranda drill holes NG-11 to NG-52. AMEC considers the Noranda assays acceptable for use in resource estimation, but because of the uncertainty in the assays, AMEC recommends that blocks affected by Noranda assays have a maximum classification of Indicated Mineral Resources
- The trench assays are not part of the mineral resource model and so the uncertainty in the accuracy of these assays poses no risk to the Mineral Resource estimate
- The quality of the geological logging of drill holes at Gibellini Hill is variable by campaign
- Redox domain boundaries as interpreted by American Vanadium are acceptable for use in the Mineral Resource model.

12.1.2 RMP Data Review

The fine-grained and diffuse nature of mineralization would favor there being no grade bias caused by poor recovery

AMEC reviewed the round robin programs performed to generate the recommended values for the SRMs used in the 2007–2008 drill campaigns, and found them to be acceptable. All SRM results fell within acceptable limits and no significant bias was observable in the control charts. In AMEC's opinion, the accuracy of the 2007 ALS Chemex vanadium assays was acceptable to support Mineral Resource estimates.

A total of four blanks were submitted with 1.125 routine samples for an insertion rate of 0.4%. In AMEC's opinion, this insertion rate should be increased to the same rate as the SRMs and duplicate samples. Blanks assayed between 80 ppm and 110 ppm V, which is significantly above the lower detection limit for vanadium of 10 ppm, but significantly below the anticipated cut-off grade. AMEC recommended that RMP generate a new blank sample consisting of material lower grade in vanadium, with an average grade of less than 10 ppm vanadium.

A total of 23 field duplicates were submitted with 1,125 routine samples for an insertion rate of 2.0%. AMEC calculated the precision for vanadium to be ±24% at the 90th percentile. In AMEC's opinion the precision for 2007 ALS Chemex vanadium assays was acceptable to support mineral resource estimates

AMEC compared drill hole collar elevations to the electronic topography. Five of the 148 drill hole collars showed elevation differences of greater than ten feet as they relate to topography, which suggested an incorrect location or an error in the topographic base.

12.2 2011 Verification Program

12.2.1 QA/QC Review

A total of 55 SRMs, 30 duplicates, and 25 blanks were submitted with a total of 1,003 project samples during the 2010 drilling at Gibellini Hill and Vanadium Hill.

AMEC finds the insertion rates of the control samples to be low compared to best practice and recommends increasing the rate of SRMs, duplicates, and blanks to five percent each.

RMP used three SRMs from Minerals, Exploration, and Environment Geochemistry (MEG) from Washoe Valley, Nevada. The SRMs have a range of grades consistent with what is expected from project samples at Louie Hill. All SRM results for vanadium except four were within six percent of the recommended value of the SRM. AMEC considers the ALS Chemex vanadium data to be acceptably accurate.

Blank samples submitted with the Project samples reported values consistent with the grades expected from the material. AMEC considers the blank material to contain too much vanadium to be useful as a blank, and RMP has recently produced another blank for use with the Gibellini and Louie Hill projects.

Duplicate data show acceptable precision for field duplicates at the 90 percent percentile. AMEC considers field duplicate data to be acceptably precise if 90 percent of the duplicate pairs report absolute relative differences (ARD) less than 30 percent. The Louie Hill data reported 13 percent ARD at the 90 percent percentile.

RMP submitted a total of 61 pulps from 2010 project samples and submitted them to ACME in Vancouver, Canada. AMEC compared the ACME check assays to the original ALS Chemex assays and found them to be comparable. No significant bias was observed in the check assay data and thus AMEC concludes that the ALS Chemex data are acceptably accurate. No quality control samples were submitted with the batch of pulps submitted to ACME.

AMEC considers the ALS Chemex vanadium assay data for Gibellini Hill and Louie Hill to be acceptably accurate, precise, and free of contamination in the sample preparation process for use in Mineral Resource estimation.

12.2.2 Gibellini Hill Twin Drill Program Review

RMP twinned eight legacy drill holes at Gibellini Hill in order to verify legacy assay results. AMEC tabulated the cumulative relative grade differences between RMP and legacy Noranda and Atlas drill holes by oxidation state. For example Atlas drill holes within the oxide domain show a total cumulative footage of 305 feet and weighted average V_2O_5% grade of 0.221. This compares well to RMP twin drill holes totaling 305 feet and a weighted average V_2O_5% grade of 0.223, a relative difference of plus one percent. AMEC is of the opinion that relative differences that are generally within $\pm$5 percent confirm the legacy drill results. Relative differences in the 10 percent range or greater require further investigation, and adjustments to assay grade may be required before use in resource estimation.

AMEC noted two domains with elevated relative differences, Atlas transition at -9 percent and Noranda reduced at -22 percent as compared to RMP drill results. All other domains have less than five percent relative differences or just slightly above and no adjustments to the vanadium grades are recommended.

AMEC plotted the Atlas transition domain assay results against RMP drill results on a quintile–quintile plot. AMEC noted that the Atlas transition domain shows different linear trends from 0% V_2O_5 to 0.410% V_2O_5, from 0.410% V_2O_5 to 0.510% V_2O_5, and greater than 0.510% V_2O_5. AMEC recommends that Atlas assays be adjusted as follows:

- From 0% V_2O_5 to 0.409% V_2O_5 - adjusted down by 25 percent,
- From 0.410% V_2O_5 to 0.510% V_2O_5 - adjusted down by five percent, and
- Greater than 0.510% V_2O_5 - adjusted up by 15 percent.

AMEC recommends that American Vanadium drill additional Atlas twin holes to duplicate approximately 10 percent of legacy drill holes.

AMEC also plotted the Noranda primary domain assays against American Vanadium drill results using a quintile–quintile plot. AMEC recommends that Noranda reduced assays be adjusted downward by 20 percent.

12.2.3 Louie Hill Twin Drill Program Review

AMEC's comparison of the legacy Union Carbide data to the American Vanadium assay data at Louie Hill found that the Union Carbide assays are biased about 10 percent high on average. AMEC has reduced the V_2O_5 grades for the Union Carbide drilling by seven percent prior to resource estimation. Because of the uncertainty in the drilling methods, sample preparation and assay methodology, and the grade bias when compared to the American Vanadium assays, AMEC has limited the classification of resource blocks that depend upon the Union Carbide drill holes at Louie Hill to the Inferred Resources category.

12.3 Comments on Section 12

AMEC considers that a reasonable level of verification has been completed, and that no material issues would have been left unidentified from the programs undertaken. The QPs, who rely upon this work, have reviewed the appropriate reports, and are of the opinion that the data verification programs undertaken on the data collected from the Project adequately support the geological interpretations, the analytical and database quality, and therefore support the use of the data in Mineral Resource and Mineral Reserve estimation at Gibellini Hill, and in Mineral Resource estimation at Louie Hill:

- Sample data collected adequately reflect deposit dimensions, true widths of mineralization, and the style of the deposits
- AMEC completed a database audit in 2008. Conclusions from that audit were that the data were generally acceptable for Mineral Resource estimation
- Data made available after the 2008 review were audited in 2011. Conclusions from that audit were that corrections were required to Noranda and Atlas assay data at Gibellini Hill, and to the Union Carbide assays at Louie Hill. AMEC also recommended as a result of the audit that additional twin holes should be drilled at Gibellini Hill to verify Atlas data
- Drill data were verified by AMEC prior to Mineral Resource and Mineral Reserve estimation by running a software program check.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Extensive metallurgical research was carried out by CSMRI, Noranda Research Centre, and Hazen Research from 1972 to 1975 on various aspects of metallurgical testwork on Gibellini Hill mineralization (Condon, 1975). Only the work completed by Noranda was available for review.

13.1 Noranda Metallurgical Testwork

Three material samples, GI-9583, GI-9585 and GI-9633, were taken by Noranda and sent to SGS Lakefield Research Laboratories (SGS Lakefield) in Canada. The samples were stage-crushed to minus half-inch. The crushed sample was split into four samples. Two splits were reserved, one split was used for testing at minus half-inch and the last split was stage crushed to minus 10 mesh. The minus 10 mesh was split into four parts: one for testing, one for head analysis, one pulverized, and one reserved.

The samples were analyzed for vanadium and a multi-element analysis was completed. The samples were screened and the individual fractions were analyzed for vanadium. The minus fractions (pan) were also analyzed using X-ray diffraction (XRD).

The test samples were prepared for testing by mixing an amount of concentrated sulfuric acid with the material and allowing the material to rest (cure) for 24 hours. A second set of samples were prepared in the same manner but also had manganese dioxide added to them prior to acid addition.

The cured samples were then added to bottles and sufficient water was added to make a 40 percent solid slurry. The bottles were placed on a set of rolls and rolled for 96 hours. Samples were removed at timed periods and analyzed. After 96 hours, the slurry was removed from the bottle, filtered and washed. The initial filtrate and the washed residue were analyzed for vanadium. The residue was also analyzed using the multi-element method. Oxidation reduction potential (ORP or Eh) and pH measurements were taken at each sample point.

A portion of the dried residue was screened and the individual fractions were analyzed for vanadium.

13.1.1 Head Analysis

The vanadium head grade analyses for the three samples are shown in Table 13-1.

Table 13-1: Vanadium Grades, Material Samples

Sample	%V	$\%V_2O_5$
GI-9583	0.19%	0.39
GI-9585	0.30%	0.54
GI-9633	0.37%	0.66

The multi-element analysis indicates that there is a slight difference in the samples with GI-9583 having more zinc, aluminum, magnesium and iron than the other two samples. Sample GI-9633 contained more calcium than the other two samples.

The XRD analysis identified a vanadium mineral (fernandinite) in sample GI-9633. XRD analysis identified mineral species that are in excess of one percent. Since the grade of the samples is low, the lack of identification in the other samples is not unexpected. Other minerals identified were quartz, feldspar, mica, and kaolinite.

13.1.2 Bottle Roll Test Results

Bottle roll test results are presented in Table 13-2 for the tests that used 300 pounds per ton of sulfuric acid, and in Table 13-3 for the bottle roll tests that used the same concentration of sulfuric acid, but also had manganese dioxide added.

The leaching data indicate that GI-9583 behaves differently to GI-9585 and GI-9633. The recovery of this sample is significantly lower than the other samples. The screen analysis shows that all size fractions are leached to a similar extent. The addition of manganese dioxide is probably not required, since the recovery is not substantially improved.

13.1.3 Interpretation of the Test Results

The data accumulated shows several important factors about the material:

- The vanadium mineral identified is an oxide mineral,
- The recovery from the coarse material is essentially the same as the fine ground material,
- The material samples do not appear to be the same, and
- The amount of acid utilize may be able to be decreased.

The XRD analysis of the samples identified fernandinite ($CaV_8O_{20}.\ xH_2O$). This mineral is a mixture of 4^+ and 5^+ vanadium ions. This mixed oxidation state indicates that the mineral would require oxidation to form the soluble vanadate ion.

Table 13-2: Recovery for Tests using 300 lbs/t Sulfuric Acid

Sample	-1/2 inch	-10 mesh	-200 mesh
GI-9583	40.3%	38.5%	41.7%
GI-9585	70.1%	66.5%	69.9%
GI-9633	83.6%	85.3%	86.5%

Table 13-3: Recovery for Tests using 300 lbs/t Sulfuric Acid and Manganese Dioxide

Sample	-1/2 inch	-10 mesh	-200 mesh
GI-9583	36.5%	40.3%	38.7%
GI-9585	69.9%	70.5%	68.4%
GI-9633	86.7%	87.4%	85.8%

Since the vanadium minerals are at a concentration below the detection limit, the leaching data would have to be used to determine if the mineral species are similar. From this leaching data it appears that the samples contain the same, or similar, oxide forms of vanadium.

The recovery for each sample was essentially the same for all three size ranges tested. The fractional analysis shows vanadium recovery from all size fractions, indicating that the mineral is liberated even at a coarse size. This information is important since it indicates that heap leaching could be a viable recovery method.

The data also indicated that leaching at a coarser material sizing may be possible. Data also indicate that it would be valid to use a leaching procedure on pulverized samples to predict the amount of soluble vanadium present. This type of method could be used as an exploration tool and as an ore-control method during mining operations.

The difference in recovery for the samples indicates that there were either different vanadium minerals present or that liberation was an issue. Because the pulverized sample should have shown higher recoveries if liberation was an issue, liberation issues were eliminated as a possibility for explaining the lower recoveries. Another possible interpretation for these data are that some of the vanadium minerals are encapsulated as an ultra-fine mineral in a mineral matrix or some of the vanadium minerals are in a reduced form that was not solubilized.

The amount of acid consumed during the leaching was quite low, and it is possible that the amount of acid utilized was more than would be necessary to achieve dissolution of the material. The reduction of acid required to dissolve the vanadium would enhance the Project economics since acid usage is about half of the production cost for the vanadium.

13.2 2008 PA Metallurgical Test Work

13.2.1 2008 PA Ore Description

The initial phase of the test program was for Dawson Mineral Laboratories (Dawson) in Salt lake City, Utah to take the core samples supplied by American Vanadium (then RMP) and prepare the samples. Data generated by Dawson for this showed the sample head grades for the core samples are indicated in Table 13-4.

13.2.2 2008 PA Test Results

The initial test work at Dawson was set up to benchmark their procedures with the SGS Lakefield work. The initial works on the same samples as used by SGS Lakefield were to test the effect of acid concentration. These tests showed that the acid concentration could be lowered to 100 kilograms per tonne (200 pounds per short ton) sulfuric acid.

The samples tested at SGS Lakefield were surface samples and the Dawson test samples for the columns were core samples. When the initial bottle roll tests were done at 200 pounds per ton, the recovery was lower than expected. An additional series of tests were done using 300 pounds per ton and the recovery increased to the levels expected. Based on these data the columns were set up to use 300 pounds per ton sulfuric acid on the oxide and transition samples and 350 pounds per ton on the reduced sample. Additionally, because the reduced sample's grade was lower than expected, a fourth sample was acquired from sampling another RMP core drill hole.

This test work indicated that the recoveries for oxide, transitional and reduced material would be as indicated in Table 13-5.

It was thought that the vanadium material might exhibit a constant tail character since the recovery was essentially the same for the samples regardless of how coarse the sample. The recovery was essentially the same for the minus half-inch samples and the -100 mesh samples.

A bottle roll program was set up to test RC cuttings from around the deposit area. This program showed that recovery varied with grade and sample and in at least for bottle roll tests there was no constant tail relationship. Two additional tests were performed to determine if increased retention time would affect recovery. The column test data shows higher recovery than the bottle roll test data. Part of the difference is associated with the difference in the assay head and the calculated head of the columns but there also appears to be more overall recovery despite the head differences. These data show the recoveries indicated in Table 13-6.

Table 13-4: Head Grades, 2008 PA Samples

Sample	Head Grade %V	Head Grade % V_2O_5
Oxide	0.139	0.248
Transition	0.185	0.330
Low Grade Reduced	0.104	0.186
High Grade Reduced	0.185	0.330

Table 13-5: Bottle Ross Test Recovery Data

Sample	Recovery (%)
Oxide	34.6
Transition	55.4
Reduced	25.4

Table 13-6: Column Test Recovery Data

Sample	-1/2 "	-2"
Oxide	57.2%	59.6%
Transition	65.4%	72.1%
Reduced	52.3%	No Column

The initial minus half-inch columns (oxide and transition) did not utilize 25 grams per liter acid solution as the column wash solution and this appears to have slightly affected the recovery to the low side as compared to the minus two-inch columns that utilized 25 grams per liter throughout the test work. The columns also showed low acid consumption (see Table 13-7).

Since the columns contain the largest samples utilized and represent the more rigorous comparison to what would be expected from a heap leach operation, the recoveries derived from the columns are the most reliable indicator of heap leach recovery. Table 13-8 outlines AMEC's recommended study recovery values and acid consumption.

The difference between the column results and the bottle roll tests (which is usually considered to perform the more complete leaching) may be due to the longer time of contact of the solution and material (bottle roll 96 hours versus column 46 days) or possibly that the bottle roll test may allow a saturation of the vanadium in solution and therefore inhibit further dissolution.

During the bottle roll testing, it was noted that the filtration of the samples was very slow. It was postulated that there were clay or silt particles present and that these particles might adversely affect the percolation of the columns.

Table 13-7: Comparison of Acid Consumption, - ½" and 2" Columns

Sample	-1/2 "	-2"
Oxide	119 lbs/t	101 lbs/t
Transition	115 lbs/t	90 lbs/t
Reduced	115 lbs/t	No Column

Table 13-8: AMEC Recommended Study Recovery Values and Acid Consumption

Material	Recovery (% V_2O_5)	Acid Consumption (lbs/ton)
Oxide	65	300
Transition	70	300
Reduced	52.3	300

It was recommended that when the samples were contacted with acid that a polymer be utilized to agglomerate the fines. Samples of polymers were obtained from Hychem and a screening test was done to determine which polymer would work best.

AE 852 appeared to work the best and the addition rate of 0.5 pounds per ton wash was chosen. No fines migration or plugging was observed during the column tests when the polymer was added to the material prior to being loaded into the columns.

13.2.3 PA Recommended Additional Work for the Feasibility Study

The metallurgical testing program for the scoping study was done to determine the viability of heap leaching for the Gibellini vanadium material. The previous work indicated the amenability of the Gibellini material to heap leaching, however, the results were not conclusive.

The present test program has indicated that bottle roll testing does not give a direct relationship to the ability to heap leach. The bottle roll data had as much as 20 percent to 30 percent lower recovery than the column leach data.

One item that might be tested is the longer retention time or lower bottle roll slurry density. The longer time might allow additional leaching to occur. If a lower slurry density (30 percent rather than 40 percent, which was used in the present testing) would make sure that all available vanadium minerals would be dissolved (assuming that a finite dissolution of the vanadium was reached). Saturation of vanadium may have been reached in the bottle roll test because crystals formed in the column solutions that had to be diluted to be dissolve. Consequently, if vanadium dissolution is a factor, doing additional test work using a lower slurry density in the bottle roll test may help to get the bottle roll and column results more closely correlated.

AMEC recommends that additional column tests be done to determine if the leaching can be done with different polymers at a lower concentration, if lower amounts of acid can be used to obtain the same recovery, if samples from different parts of the deposit will have the same recovery profile as the samples tested in this program, if the material can be leached without polymer addition, and if the material could be run without crushing (run of mine leaching). The run of mine leach would require that the material be delivered to a process area where it could be contacted with the concentrated acid so it could be cured. The material would have to be minus six inch for proper material handling.

This test work is suggested so a lower-cost method of testing (bottle roll tests) can be used to gather additional information for the ore body. The test work is also set up to determine if the polymer usage could be decreased and the cost lowered or eliminated. Another purpose of the test work is to determine if lowering the acid added during curing can still provide sufficient leach recovery. And finally, the program would be used to determine if one or all the stages of crushing could be eliminated and maintain recovery.

13.3 Feasibility Study Test Work

American Vanadium instituted a metallurgical drilling program where six core holes were drilled to obtain samples for metallurgical testing. All test work was performed by McClelland Laboratories (McClelland), of Sparks, NV. The holes were sited and drilled north and south of the holes used for the 2008 PA testwork to obtain a spatial representation of the mineralization across the Project.

13.3.1 Test Samples

Three of the core holes were drilled north (North Zone samples) of the 2008 PA metallurgical hole and three were located south (South Zone Samples) of the 2008 metallurgical drilling. The samples were prepared at McClelland and the head grades for the samples are shown in Table 13-9.

Surface samples were taken at the site for testing of run-of-mine (ROM) leaching. Eight samples were taken from around the site and shipped to McClelland. When the samples arrived at the laboratory and were laid out to air-dry, it was seen that there was very little coarse ore present. The site personnel were questioned as to the material taken and they reported that the material was typical of the surface material.

A site visit was made and the excavations were checked and it was determined that very little of the material at surface would be coarse. Three more sites were selected and that material was combined with the one coarse sample sent initially.

Table 13-9: Head Grades, Feasibility Study Testwork Samples

Sample	Initial Assay Grade (% V)	Duplicate Assay Grade (%V)	Triplicate Assay Grade (%V)	Average Assay Grade %V (V_2O_5)
North Zone Oxide	0.103	0.103	0.103	0.103 (0.184%)
North Zone Transition	0.151	0.145	0.147	0.148 (0.264%)
South Zone Oxide	0.163	0.162	0.162	0.162 (0.288%)
South Zone Transition	0.196	0.190	0.197	0.194 (0.345%)

Since the samples were taken and sent to the laboratory, a testing program for the fine material has been set up to leach the material as is and to determine the recovery of the surface material. The Gibellini metallurgical trench sample head grades are shown in Table 13-10.

13.3.2 Trench Column Results

The column tests were operated for 145 days and the extraction from the material is indicated in Table 13-11.

The average extraction for the trench samples was 58.2 percent with a head grade of 0.178 percent V and since this material was not crushed and a fair portion is above minus half-inch in size, this extraction is considered to be equivalent or better that the PA recovery seen in the oxide ore (57.2 percent at minus half-inch with a grade of 0.139 percent V).

The average acid consumption was 41.7 pounds per ton for the trench samples.

The ROM material was significantly coarser than the samples previously tested and with a low head grade (0.10 percent V). The extraction on this column was only 15.7 percent and it proves that with coarse ore, it is not feasible to operate a ROM leach facility. This ROM sample consumed significantly less acid (average 26 kilograms per tonne), which may indicate that there was less acid-soluble matrix material so less of the matrix could be opened to additional leaching.

Metallurgical Core Test Results

The core column test work showed a similar trend for lower extraction from bottle roll test than is seen in the column tests (Table 13-12).

Table 13-10: Gibellini Metallurgical Trench Head Grade Assays

Sample	Initial Assay Grade (% V)	Duplicate Assay Grade (% V)	Triplicate Assay Grade (% V)	Average Assay Grade (% V)	Calc Head Grade (% V)
GMT-1	0.137	0.133	0.147	0.139	0.154
GMT-2	0.142	0.151	0.141	0.144	0.153
GMT-3	0.253	0.244	0.252	0.250	0.289
GMT-4	0.146	0.148	0.136	0.143	0.150
GMT-6	0.143	0.133	0.145	0.140	0.151
GMT-7	0.156	0.149	0.179	0.161	0.172
GMT-Comp	0.108	0.110	0.108	0.105	0.117

Table 13-11: Gibellini Metallurgical Trench Column Test Results

Sample	% Extraction	% + ½ "	Acid Consumption lb/t	% Ca
GMT-1	61.0%	17.7%	43.7	1.20
GMT-2	49.7%	8.3%	45.6	0.78
GMT-3	74.7%	6.0%	32.2	0.32
GMT-4	51.3%	8.4%	39.3	0.64
GMT-6	40.4%	16.7%	38.0	0.76
GMT-7	69.8%	11.0%	51.7	2.15
GMT-Comp ROM	15.7%	54.6%	26.0 (in kg/t)	<0.10

Table 13-12: Column Test Work, Feasibility Study Core Samples

Sample	Bottle Roll 74 µm	Bottle Roll 1.7 mm	Bottle Roll 12.5 mm	-1/2"	-2"
NZO	22.1%	24.0%	23.4%	43.0%	444.3%
NZT	46.7%	43.2%	41.0%	58.8%	55.2%
SZO	18.0%	19.9%	16.0%	49.7%	46.5%
SZT	57.1%	46.2%	44.7%	62.5%	64.1%

There is a consistent difference between the bottle roll test extraction and column test data with the column recovery always being higher than bottle roll test recovery. The columns were run for 87 days while the bottle roll tests were run for only 96 hours, it is anticipated that the additional recovery is due to the longer exposure of the column material to the acidic environment and potentially the breakdown of the rock matrix allowing additional extraction. In this round of testing, only the South Transition Zone showed higher extraction at minus two inches compared to the minus half-inch sample as was seen in the 2008 PA testing.

13.3.3 Crusher Abrasion and Hardness Testing

Crushing testing was done on by Phillips Enterprise LLC. The test work shows a sample that is not extremely hard and quite friable. The crushing data show a sample that is quite soft (crusher abrasion 0.025 pounds per kilowatt-hour) and not requiring high energy input (5.23 kilowatt-hours per ton). Table 13-13 shows a comparison of the Gibellini Hill ore and other materials in terms of abrasiveness and work indices.

Table 13-13: Crust Test Results in Comparison to Other Materials

Material	Abrasion	Work Index
Gibellini ROM Material	0.0552 lbs/kW-hr	5.23 kW-hr/ton
Copper Ore	0.1472 lbs/kW-hr	—
Gravel	0.2879 lbs/kW-hr	—
Limestone	—	12.7 kW-hr/ton
Shale	—	9.9 kW-hr/ton
Quartzite	0.7751 lbs/kW-hr	17.4 kW-hr/ton

As seen in the comparison data, the hardest Gibellini material found on site is non-abrasive and soft when compared to other material seen in the mining industry. These data and the size fractions shown in the data collected from the column data indicate that the material is naturally broken up and quite friable.

Table 13-14 shows that the trench ore is quite fine and there is little or no degradation of the agglomerated material loaded in the columns and the final tailing sample.

13.3.4 Mineralogy and ICP Analysis

Mineralogy Examination

Samples were taken from each of the core samples and X-Ray Diffraction (XRD) analysis was done. Since the vanadium mineralization is in the trace range for the XRD instrument, separate samples of high grade mineralization were taken to look at the vanadium mineralogy. Additionally, the University of Nevada (Las Vegas) has been performing a petrographic analysis of some of the material from the Gibellini Hill area, but there is no completion schedule available at this time.

XRD analysis of the whole ore showed that plus 80 percent of the material was silica minerals, about 11 percent was mica/illite, about four percent was apatite and five percent was “unidentified other”. In the North Zone Oxide (NZO) and South Zone Transition (SZT) areas, less than four percent dolomite was identified as being present.

ICP Analysis

Inductively-coupled plasma (ICP) analysis was performed on all of the material tested. The overall elemental analysis is similar between the various materials with relative amounts of vanadium, calcium, and phosphorous having the widest variation from each other. No correlation has been developed between this variation and recovery. Even the amount of calcium present does not always indicate a higher acid consumption.

Table 13-14: Trench Sample Size Analysis

Sample	Size	Head % Passing 600 µm	Tail % Passing 600 µm
GMT-1	As Is	26.7	28.9
GMT-2	As Is	23 0	24.8
GMT-3	As Is	34.4	37.7
GMT-4	As Is	22.7	25.2
GMT-6	As Is	19.9	27.2
GMT-7	As Is	37.4	38.1
ROM	-1/2”	16.8	18.1
ROM	-2”	10.1	16.3
ROM	As Is	12.2	
NZO	2”	33.3	
NZO	½”	32.2	
NZT	2”	25.7	
NZT	½”	30.6	
SZO	2”	23.6	
SZO	½”	26.0	
SZT	2”	27.1	
SZT	½”	30.9	

13.3.5 Solvent Extraction Testing

Initial solvent extraction screening tests were done to determine conditions and reagent requirements for the solvent extraction circuit for the Gibellini Project.

Initially three different reductants were tested to determine which would work best with the pregnant leach solution (PLS). Zinc, iron, and ascorbic acid were tested and iron proved to be the most effective reductant.

13.3.6 Locked Cycle Testing

The locked cycle test utilized material from the North oxide, South Transition and the North Transition zone in the proportions shown in Table 13-15.

The objectives of the locked cycle test were:

- Determine if recycling raffinate that contains minor amounts of organic from SX negatively impacts recovery,
- Determine if composites behave in the same manner as the individual samples, and
- Obtain SX strip solution for laboratory testing and analysis.

The column was started with synthetic raffinate solution and once the SX system was started, the actual SX raffinate solution was cycled to the column adding acid to meet the 25 gallons per liter requirement.

Table 13-15: Composite Make-Up Information, Gibellini Drill Core, Master Composite

Drill Core Composite	Weight to Comp. kg	Weight to Comp. %
NZO	12.37	9.45
NZT	54.5	41.65
SZO	0	0
SZT	63.97	48.89
Composite Total	130.8	100.0

From Figure 13-1 it can be seen that the leach curve continued on without any appreciable impact, indicating that there will be no issues with utilizing process raffinate solution (main objective of the locked cycle test.

13.4 Final Product Production

Rich electrolyte was taken and an oxidant (sodium chlorate $NaClO_3$) was used to oxidize the vanadyl sulfate (blue solution) to vanadate (wheat colored). The rich electrolyte solution had a grade of 55 gallons per liter (5.5%) and a solution density of 1.325 grams per cubi centimeter. Ammonium hydroxide (concentrate NH_4OH, 28 percent) was added to a pH of 2.0. A brick red precipitate (ammonium metavanadate sulfate (AMV)) was produced. The AMV settled rapidly after agitation was stopped. The AMV was then filtered and the material was loaded into a crucible. The crucible was placed in a 730 degree Celsius furnace and fusion was completed within one hour. A “purple flake” was removed from the crucible and crushed. The final product is pending analysis. The rich electrolyte solution was still being recycled and it appeared that within the next SX recovery campaign that battery electrolyte grade would be attained. No impurity analysis is available at this time, so it cannot be determined if electrolyte quality has been attained, but it is conceivable that if impurities are present that the solution could be clean up using ion exchange.

13.5 Recovery Estimates

The process recovery for the column test worked shows a slow ascending trend (between 0.1 percent and 0.4 percent per day), this rise was consistent for a period of at least 30 days and it is anticipated that this trend would continue. Additionally, the recovery grade is based on the average grade of the material and these recoveries are consistent with the average ore grade.

Utilizing this approach, the recovery for this material is equal or higher than the recovery used in the 2008 PA, so it is anticipated that the recovery used for the 2008 PA is still applicable to the deposit.

These recovery data are indicated in Table 13-16.

Figure 13-1: Leach Curve for Comparing Locked Cycle Composite with Components of Composite

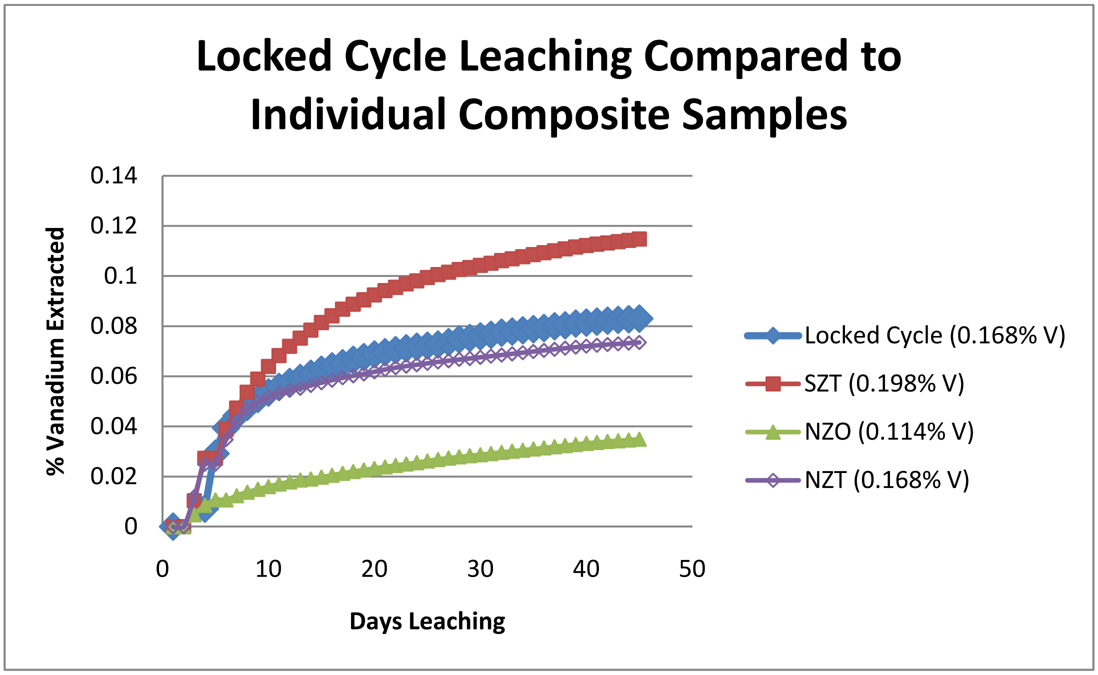


Table 13-16: Process Recoveries

Ore Type	Percent Recovery
Oxide	60%
Transition	70%
Reduced	52%

A program to identify the amenability of the reduced mineralization to heap leaching was included after the initial program was started. This material is not included in the Mineral Reserve estimate but is included in the Mineral Resource estimate. The test work utilized the material from the 2010 drilling program to expand the spatial area of the project

13.6 Metallurgical Variability

The Noranda testing composites were from a limited area of the Gibellini Hill deposit. The PA test work drilling covered a similar area to the Noranda drilling.

The Feasibility Study drilling stepped out on both side of the PA drilling. Based on comparisons between the mineralogy and lithologies encountered in the twin drill holes, it was concluded that the metallurgical samples from this drilling provided sufficiently representative data for metallurgical evaluation purposes.

13.7 Deleterious Elements

The acid leaching did not mobilize any elements during leach that would be deleterious to the solvent extraction recovery.

The major elements mobilized were aluminum, phosphorus and iron. Of these, iron loads at the pH and Eh conditions associated with solvent extraction and iron is used as a reductant to reduce vanadate (leached species) to vanadyl (extracted species). A HCl wash has been included in the process to eliminate iron build-up.

13.8 Comments on Section 13

In the opinion of the QPs, the following conclusions are appropriate:

- Metallurgical testwork and associated analytical procedures were performed by recognized testing facilities, and the tests performed were appropriate to the mineralization type
- Samples selected for testing were representative of the various types and styles of mineralization at Gibellini Hill. Samples were selected from a range of depths within the deposit. Sufficient samples were taken to ensure that tests were performed on sufficient sample mass
- The process recovery for the feasibility column test worked showed a slow ascending trend of between 0.1 percent and 0.4 percent per day, which was consistent with the trend seen in the 2008 PA column test work
- Life-of-mine average recoveries are 60 percent for Oxide material, 70% for Transition and 52% for Reduced
- The acid leaching did not mobilize any elements during leach that would be deleterious to the solvent extraction recovery predictions
- No processing factors were identified from the metallurgical testwork that would have a significant effect on extraction.

AMEC notes that commercial heap leaching and solvent extraction (SX) recovery of vanadium ores has not been done before; nonetheless, heap leaching and SX recovery are common technologies in the mining industry. The most notable examples are the multiple copper, nickel, and cobalt heap leach projects that utilize an acid-leach solution to mobilize the metal followed by recovery in a SX plant, which is then followed by electro-winning. The Gibellini process applies the same acid heap leaching and SX technology to recover vanadium. However, instead of electro-winning to produce a final product, the Gibellini process will utilize an acid strip followed by precipitation to produce a final product.

During the course of the Feasibility Study, American Vanadium identified a calcium boundary at 2.5 percent calcium. American Vanadium contoured this shape and identified that none of the metallurgical holes penetrated it; consequently, the met columns are in relatively benign material. American Vanadium also noted that the 2.5 percent calcium contour extends into the base of the transition ore included in the mine plan; specifically, in the south–central portion of the deposit the 2.5 percent calcium contour protrudes into the transition ore. This is a Project risk due to the elevated calcium levels and likely elevated acid consumption for this material.

14.0 MINERAL RESOURCE ESTIMATES

14.1 Gibellini Hill

14.1.1 Basis of Estimate

A total of 43,785 feet of drilling in 195 drill holes by four operators, Atlas, Noranda, Inter-Globe and RMP were available for geological domain modeling. A sub-set of this database totaling 39,384 feet of drilling, in 174 drill holes, was available for resource estimation.

Twenty-one drill holes totaling 5,201 feet were drilled for metallurgical, geotechnical and condemnation studies and were not used in grade estimation. The twenty-one drill holes consist of 11 core holes for metallurgical testing totaling 2,801 feet, four oriented core holes for geotechnical studies totaling 1,000 feet, and six RC condemnation drill holes totaling 1,400 feet.

Thirty-three rotary drill holes total 5,695 feet from a fifth operator, Terteling, were excluded from this study due to a high grade bias (AMEC, 2007). There is sufficient drill hole coverage from the other operators to compensate for not using the Terteling drill hole assays.

Twin drilling analysis performed by AMEC indicates that Atlas assays within the transition domain and Noranda assays within the reduced domain should be down-graded.

14.1.2 Geological Models

RMP geologists coded drill hole samples based on the three oxidation states oxidized, transition, and reduced. Oxidation domains were interpreted from drill logs based on color, assay grades, and lithology. The oxide domain was classified based on low V_2O_5 grades and lithology logged as broken, tan to white, sandy siltstone. Drill hole intervals were classified as transition if assay grades were high and drill hole logs showed a lithological change from sandy siltstone to dark gray shale. The reduced domain was interpreted based on a drop in grade and lithology logged as hard black shale.

RMP developed oxidation envelopes around drill holes projected onto cross and long sections spaced 100 feet apart. AMEC imported RMP oxidation envelopes into MineSight. From these envelopes, AMEC created polylines between the oxide-transition boundary and transition-reduced boundary. Oxidation polylines were then linked to the adjacent section to create 3-D surface to code the block model. Blocks and composites were set to a default code of reduced, then all blocks and composites above the reduced-transition surface were set to transition, and finally all blocks and composites above the transition-oxide surface was set to oxide. Proper assignment of the oxidation state was visually confirmed by AMEC by inspecting drill hole composites and blocks in cross sections, long sections, and in bench plans on the computer screen.

RMP developed mineralized envelopes or "grade polygons" to control the limits of grade interpolation in combination with oxidation state domains. Grade polygons were drawn around drill holes projected onto cross sections spaced 100 feet apart with assay grades equal to or greater than 0.050% V_2O_5. AMEC imported RMP assay grade polygons into MS and adjusted the polygons to match composite lengths. Grade polygons were wireframed to create 3-D grade domain solid in order to code composites and blocks. Composites and blocks were coded based on 50% or greater length or volume, respectively, within the grade domain. Within the 0.050% V_2O_5 grade domain, the total number of composites coded is 3,106 and total number of blocks coded is 55,168. Proper assignment of the grade domain code was confirmed by AMEC by inspecting composites and blocks in cross sections, long sections, and bench plans on the computer screen. Volume comparison of the grade domain solid versus the volume of the tagged blocks shows approximately four-tenths of a percent difference.

14.1.3 Composites

Assays from Gibellini Hill were composited along the trace of the drill hole to 10-foot fixed length. Oxidation boundaries were treated has a hard during composite construction. Composites with a length of less than five feet were not used in grade interpolation. AMEC confirmed that the composites were properly calculated by manually compositing a few selected assays and comparing composite values to MineSight® results.

14.1.4 Exploratory Data Analysis

Noranda drilling shows the highest average grade at 0.296% V_2O_5, whereas RMP has the lowest average grade at 0.122% V_2O_5. Noranda concentrated their drilling to the central portion of the vanadium occurrence and tested only the higher grade oxide and transition zone. Approximately 99.7% of the sample intervals are five feet in length. Eighteen assay intervals are shorter and eight assay intervals are greater than five feet, but none exceeds 15 feet.

AMEC investigated and developed assay statistics based upon oxidation domains. The transition domain shows a mean grade 50 percent higher than that of the oxide domain and more than three times that of the reduced domain. Transition domain shows much higher mean grade at 0.344% V_2O_5 as compared to oxide and reduced at 0.229% V_2O_5 and 0.106% V_2O_5 respectively. The transition and oxide box which represents the 25th to the 75th percentile is thinner than the reduced domain, indicating a narrow grade distribution between the 25th to 75th percentiles.

AMEC found that the grade discontinuity between major lithologies was minor and that grade interpolation should not be restricted across lithological boundaries. AMEC ran contact plots for vanadium grades by oxidation domain with the additional assay data collected since the 2008 PA. Contact analysis between the oxidation domains continue to show a large grade disparity between domain. AMEC has treated the domain contacts between the oxidation states as hard for grade estimation.

14.1.5 Density Assignment

Tonnage factors were calculated from specific gravity measurements and assigned to the blocks based on oxidation domain (Table 14-1).

14.1.6 Grade Capping/Outlier Restrictions

Capping limits for Gibellini Hill were investigated using a Monte-Carlo risk simulation methodology in the 2008 PA which showed the suggested capping levels were not much higher than the mean grades. The assay distribution, at a cut-off grade above 0.1% V_2O_5, displays a normal distribution, is not heavily skewed, and lacks a long grade tail. Monte-Carlo risk simulation would be more appropriate for skewed distributions.

Using all assays above 0.05% V_2O_5, the 90–100 decile shows a total metal content of 6.6 percent. The 99–100 percentile show a total metal content of 1.3 percent. This suggests that capping is not warranted. AMEC did not cap assays, but capped three high-grade composites greater than 1.5% V_2O_5 to 1.5% V_2O_5. AMEC allowed all composites to interpolate grade out to 110 feet and capped composites greater than 1% V_2O_5 to 1% V_2O_5 beyond 110 feet.

Comparing an uncapped and unrestricted kriged model to the capped and outlier restricted kriged model, indicate that approximately 0.2 percent of the metal has been removed.

Table 14-1: Block Model Tonnage Factor

Oxidation Domain	Average S.G. (gm/cm^3)	Tonnage Factor (ft^3/ton)
Oxide	1.90	16.86
Transition	1.96	16.35
Reduced	2.26	14.18

14.1.7 Variography

AMEC used Sage2001® to construct and model experimental variograms using the correlogram method and henceforth referred to as variograms. AMEC developed and reviewed variograms for each of the oxidation domains within the grade shell and a set of variograms that included all data within the grade shell. The variograms from each of the oxidation domains were considered to be of poorer quality then that produced by using all composites within the grade shell. AMEC expects that the cause is due to using a smaller number of composites for each of the oxidation domain. AMEC is of the opinion that the quality of the variograms for all composites within the grade shell, are very good and supports their use in resource classification.

Spherical models with two structures were fitted to the V_2O_5 experimental variograms. The nugget effects were established using down-the-hole variograms where the short-range variability is well defined.

14.1.8 Estimation/Interpolation Methods

Within Grade Shells

Only composites from RMP, Noranda, Inter-Globe, and Atlas were used for grade interpolation. Hard contacts were maintained between oxidation domains – oxide blocks were estimated using oxide composites; transition blocks were estimated using transition composites; and reduced blocks were estimated using reduced composites. A range restriction of 110 feet was placed on grades greater than 1% V_2O_5 for each of the domains.

Ordinary kriging was used to estimate vanadium grade into mine blocks previously tagged as being within the 0.05% V_2O_5 grade domain solid. Two kriging passes were employed to interpolate blocks with vanadium grades.

A larger first pass interpolation required a minimum of eight composites, a maximum of 12 composites and no more than four composite per drill hole. A second pass using a smaller search distance was allowed to overwrite the first pass but required a minimum of eight composites, a maximum of 16 composites, and no more than four composites per drill hole. Passes one and two used a quadrant search with a maximum number of four composites per quadrant.

Outside of Grade Shells

AMEC interpolated blocks for grade that where outside of the grade shell using only composites external to the 0.05% V_2O_5 grade shell. These composites generally contain values of less than 0.05% V_2O_5. Mine block tabulation indicate that there were no oxide or transition blocks above the resource cut-off grades and only 2,645 Inferred tons of reduced material above a cut-off grade of 0.088% V_2O_5 averaging 0.120% V_2O_5 were interpolated.

14.1.9 Block Model Validation

The block model was validated using:

- Visual inspection
- Comparing the means of the OK grade to the NN grade for blocks identified as potentially being Measured and Indicated Resources
- Evaluating degree of smoothing in the kriged block model estimates
- Swath plots

No potential biases were noted in the model from the validations.

14.1.10 Classification of Mineral Resources

AMEC calculated the confidence limits for determining appropriate drill hole spacing for Measured and Indicated Resources. The statistical criterion used by AMEC for Measured Resource is that a quarterly production (0.75 Mt) should be known to at least within ±15 percent with 90 percent confidence. A drill hole grid spacing of 110 feet gives a 90 percent confidence interval of ±6 percent on a quarterly basis.

Mineral resources were classified as Measured when a block is located within 85 feet to the nearest composite and two additional composite from two drill hole are within 120 feet. Drill hole spacing for Indicated Resources would broadly correspond to a 110 x 110 foot grid.

The statistical criterion used by AMEC for Indicated Resource is that a yearly production (3 Mt) should be known to at least within ±15 percent with 90 percent confidence. A drill hole grid spacing of 220 feet gives a 90 percent confidence interval of ±6 percent on an annual basis. Mineral resources were classified as Indicated when a block is located within 170 feet to the nearest composite and one additional composite from another drill hole is within 240 feet. Drill hole spacing for Indicated Resources would broadly correspond to a 220 x 220 foot grid.

Visual checks on cross section and plan show good geological and grade continuity at this distance. However, tighter drill grid spacing may be required to define high grade zones, ore and waste contacts, structural offsets, and to define final pit limits. AMEC recommends that American Vanadium continues to maintain a maximum drill grid spacing of less than 220 feet for Indicated Resources.

AMEC is of the opinion that continuity of geology and grade is adequately known for Measured and Indicated Resources for grade interpolation and mine planning.

Classification of Inferred Resources required a composite within 300 feet from the block.

14.1.11 Reasonable Prospects of Economic Extraction

AMEC determined the extent of resources that might have reasonable expectation for economic extraction, as required by CIM (2003, 2010), by applying a Lerchs–Grossmann (LG) pit outline to the resources. The pit cone was run using a long-term V_2O_5 price of $12.59 per pound and recoveries for oxide at 60 percent, for transition at 70 percent and reduced at 52 percent. Processing and general and administrative (G&A) costs of $11.01 per ton, a mining cost structure that applied a base cost of $2.50 per ton, an NSR royalty at two percent, shipping and conversion cost of $0.374 per pound V_2O_5, were applied to resource blocks above economic cut-off. Cones were run at variable pit slopes as indicated by geotechnical studies.

The $12.59 vanadium price was selected based on the long term forward average price of $10.95 for V_2O_5 and approximately a 15 percent increase in the price to account for fluctuation in metal price.

14.2 Louie Hill

14.2.1 Basis of Estimate

The drill hole database used in developing the mineral resource estimate totaled 7,665 feet in 58 drill holes, and was closed as of 1 May 2011. Union Carbide contributed 49 drill holes to the database with a total of 706 V_20_5% assays. Nine drill holes drilled by American Vanadium with a total of 547 V_20_5% assays were also included.

A three-dimensional MineSight® block model was created to estimate the V_20_5% resource. The model is un-rotated. Topography was loaded into the model and blocks were coded. Block size was 25 feet x 25 feet x 20 feet.

14.2.2 Geological Models

American Vanadium supplied AMEC with geologic interpretations, 10 cross sections and three long sections. The cross sections are spaced at 300 feet and long sections are spaced at 200 feet. The sections were comprised of lithology, fault, and mineralization interpretations. AMEC recommends that oxidation states be modeled in the next iteration of modeling at Louie Hill.

AMEC reconciled the cross sections in plan and used the mid-bench poly-lines to code the block model for mineralization percent. Block codes for mineralization were then used to code composites as being mineralized or non-mineralized.

14.2.3 Composites

Assays from Louie Hill were composited down-the-hole to 20 foot fixed lengths. AMEC confirmed that the composites were properly calculated by manually compositing a few selected assays and comparing composite values to MineSight® results.

14.2.4 Exploratory Data Analysis

AMEC coded the Louie Hill composites as mineralized if they were within the mineralized envelope, and as non-mineralized outside of the mineralized envelope. The envelope was defined by American Vanadium and supported by AMEC probability plot data.

Using all composite data, the probability plot shows two distinct domains, a mineralized domain and a non-mineralized domain, split at 0.2% V_20_5. AMEC coded the composites for the two domains and ran the probability plots by domain. Back loading the mineralization code from the blocks to the composites appropriately separated the two domains. A hard boundary was used to separate the domains.

Box plots show two populations with low coefficients of variation (CV), (standard deviation/mean), of 0.57 for mineralized and 0.757 for non-mineralized. The low CV values indicate that estimating the block grades for the two domains should not be problematic.

14.2.5 Density Assignment

As no measurements have been completed to date on mineralization from Louie Hill, the Gibellini Hill data were used in the Louie Hill estimate.

14.2.6 Grade Capping/Outlier Restrictions

AMEC did not consider that grade capping was warranted at Louie Hill. Assay grades were continuous and did not show high grade outliers.

14.2.7 Variography

AMEC ran the Louie Hill variograms using Sage2001® software. First a down hole variogram was run and modeled for obtaining the nugget value. All variograms were run using all composites as there were insufficient data to run composites by individual domain.

Grade interpolations were limited to blocks within a 0.05% V_2O_5 mineralized domain that was constructed on 100 foot-spaced cross sections and wireframed into a solid. Composites within the grade domain were assigned a unique domain code and composites external to the grade domain were given a unique domain code.

A set of variograms were run at 30 degree increments vertically and horizontally to obtain an anisotropy ellipsoid for Ordinary Kriging (OK) grade estimation. The anisotropy ellipsoid defined by the variogram analysis was used to define the three dimensional search ellipsoid and composite weighting used in the OK grade estimation of V_20_5%.

14.2.8 Estimation/Interpolation Methods

Ordinary kriging (OK) was used to estimate V_20_5% grades into blocks domain tagged as mineralized and non-mineralized. Hard contacts were maintained between the domains. A range restriction of 200 feet was placed on grades greater than 0.15% V_20_5, for blocks within the non-mineralized domain. The range restriction was only used for blocks outside of the mineralized domain. Blocks within the non-mineralized domain were not considered as having resource potential; hence no metal was lost in the resource due to the 200 foot range restriction. The sparse mineralization found within the non-mineralized domain does not have the continuity required for resource classification.

Two kriging passes were employed to interpolate grades into the mineralized domain blocks. Blocks that contained both percentages of mineralized and non-mineralized material were weight averaged for a whole block V_20_5 percentage grade.

For the mineralized domain a less restrictive first pass interpolation required a minimum of three composites, a maximum of twelve composites and no more than three composites per drill hole. A second pass was allowed to overwrite the first pass but required a minimum of four composites, a maximum of twelve composites, and no more than three composites per drill hole. The first pass used search distances of 2,000 feet along the long axis, 410 feet along the short axis, and 200 feet along the vertical axis. The second pass restricted the search to 1,500 feet, 310 feet, and 150 feet, for the long, short, and vertical axis respectively.

14.2.9 Block Model Validation

AMEC constructed an NN model to compare to the OK grade block model. Nearest-neighbor grade interpolation also honored the interpolation parameters as applied to the OK grade model. For all blocks classified as Inferred, the V_20_5% OK estimation matched the NN grade estimation very well.

A relative percentage value of less than 5% difference between the means is an acceptable result and indicates good correlation between the two models; the mean grades of the two models show less than 3% difference for Inferred blocks.

14.2.10 Classification of Mineral Resources

The 2010 CIM *Definition Standards for Mineral Resources and Mineral Reserves* require that blocks be classified with sufficient confidence to allow for application of technical and economic parameters to support mine planning and evaluate the economic viability of the deposit. Because of the uncertainty in the drilling methods, sample preparation, assay methodology, and the slight grade bias of the Union Carbide's assays as compared to the American Vanadium assays, AMEC has limited the classification of resource blocks to the Inferred Resources category.

One of the AMEC guidelines is for Indicated Resources to be known within ± 15 percent with a 90 percent confidence on an annual basis and for Measured Resources to be known within ± 15 percent with a 90 percent confidence on a quarterly basis. At this level, the drill spacing is usually close enough to permit the assumption of grade and volume (ton) continuity between drill holes.

Additional infill, deeper, and step out drilling is recommended at Louie Hill to test for possible higher-grade transition zone below the oxide domain, contacts between mineralization and waste, location of structural offsets, and further twin sampling of Union Carbide drill holes. When additional drill data is available, AMEC recommends that American Vanadium complete a drill hole spacing study that applies the above confidence limits, for calculation of drill spacing required for Measured and Indicated Resource class.

14.2.11 Reasonable Prospects of Economic Extraction

AMEC assessed the classified blocks for reasonable prospects of economic extraction by applying preliminary economics for potential open pit mining methods. The assessment does not represent an economic analysis of the deposit, but was used to determine reasonable assumptions for the purpose of determining the mineral resource.

Table 14-2 shows the economic considerations used to produce the open pit shell that the Mineral Resources were constrained within. AMEC is of the opinion that blocks which display geological and grade continuity, and are contained within a pit shell generated using these parameters meet reasonable prospects for economic extraction.

14.3 Mineral Resource Statement

Mineral Resources take into account geologic, mining, processing and economic constraints, and have been confined within appropriate LG pit shells, and therefore are classified in accordance with the 2010 CIM Definition Standards for Mineral Resources and Mineral Reserves.

Mr Edward J.C. Orbock III, an AMEC employee, is the Qualified Person (QP) for the Mineral Resource estimate for Gibellini Hill. Mineral Resources have an effective date of 31 July, 2011, and are reported inclusive of Mineral Reserves.

Mr. Mark Hertel, P.Geo, an AMEC employee, is the QP for the Mineral Resource estimate for Louie Hill. Mineral Resources have an effective date of 20th May 2011.

Mineral Resources for Gibellini Hill are included as Table 14-3, whereas the Mineral Resources for Louie Hill are included as Table 14-4. Mineral Resources are stated using cut-off grades appropriate to the oxidation state of the mineralization.

Table 14-2: Assumptions used in Louie Hill L-G Shell

Description	Units	Oxide
Mining (inc. sustaining)	$/t moved	2.64
Processing	$/t processed	8.90
Stockpile Rehandle	$/t processed	0.54
Sustaining	$/t processed	0.47
Closure Costs	$/t processed	0.29
Total Process	$/t processed	10.34
G&A	$/t processed	0.67
Recovery	% V_2O_5	60%
Royalty	% V_2O_5	2%
Cash Flow Price	$/lb V_2O_5	6.5
Resource Price	$/lb V_2O_5	12.60
Selling Cost	$/lb V_2O_5	0.374
Overall Pit Slope	degrees	45

Table 14-3: Gibellini Hill Mineral Resource Estimate, Effective Date July 31, 2011, Edward J. C. Orbock III, SME Registered Member

Resource Class	Domain	Cut-off V_2O_5 (%)	Tons (Mt)	$V_2O_{5)}$ (%)	V_2O_5 (Mlb)
Measured	Oxide	0.08	3.95	0.25	19.83
	Transition	0.07	3.95	0.38	29.88
Indicated	Oxide	0.08	8.01	0.22	35.05
	Transition	0.07	7.15	0.33	46.62
Total Measured and Indicated		various	23.05	0.29	131.37
Inferred	Oxide	0.08	0.16	0.16	0.98
	Transition	0.07	0.01	0.22	0.07
	Reduced	0.09	14.05	0.17	48.37
Total Inferred		various	14.23	0.17	49.41

Notes to Accompany Gibellini Hill Mineral Resources Table:

1. Mineral Resources are inclusive of Mineral Reserves
2. Mineral Resources are not Mineral Reserves until they have demonstrated economic viability
3. Mineral Resources are reported at various cut-off grades for oxide, transition, and reduced material.
4. Mineral Resources are reported as undiluted.
5. Mineral Resources are reported within a conceptual pit shell
6. Mineral Resources are reported using a long-term V_2O_5 price of US$12.59/lbs, mining and processing costs and variable recoveries that are based on the oxidation state in the deposit.
7. Rounding as required by reporting guidelines may result in apparent summation differences between tons, grade and contained metal content
8. Tonnage and grade measurements are in US units. Grades are reported in percentages.

Table 14-4: Inferred Louie Hill Mineral Resource Estimate, Effective Date 20 May 2011, Mark Hertel, SME Registered Member

Cut-off V_20_5%	Tons (Mt)	V_20_5%	V_2O_5 Mlb
0.08	7.67	0.27	41.87

Notes to accompany Louie Hill Mineral Resource Table:

1. Mineral Resources are reported above a 0.077% V_20_5% cut-off grade.
2. Mineral Resources are reported as undiluted.
3. Mineral Resources are reported within a conceptual pit shell
4. Rounding as required by reporting guidelines may result in apparent summation differences between tons, grade and contained metal content
5. Tonnage and grade measurements are in US units. Grades are reported in percentages.

AMEC performed a sensitivity case run on the Gibellini Hill estimate, to assess the impact of variation in V_2O_5 cut-off grades on the estimate. The sensitivity case is shown in Table 14-5. AMEC notes that the sensitivity evaluation tonnages and grades highlighted as the base case for Gibellini Hill are a global average tonnage and grade statement, as the actual base case uses variable cut-off grades due to recovery differences between oxidation states.

A similar sensitivity evaluation was performed for the Louie Hill estimate, and is indicated in Table 14-6 with the base case highlighted.

14.4 Factors That May Affect the Mineral Resource Estimate

Factors which may affect the conceptual pit shells used to constrain the mineral resources, and therefore the Mineral Resource estimates include changes to the following assumptions and parameters:

- Commodity price assumptions
- Metallurgical recovery assumptions
- Pit slope angles used to constrain the estimates
- Assignment of oxidation state values
- Assignment of SG values.

The Gibellini Hill resource model has a known error that has effectively reduced the overall grade for Measured and Indicated by approximately one percent. Adjustment to Atlas's transition assays between zero percent and 0.410% V_2O_5 were implemented twice. AMEC reran the model with the correction and the results indicate an approximate error of one percent. AMEC is of opinion that this error is not material to the estimate.

Table 14-5: Sensitivity of Gibellini Hill Mineral Resource at Different V_2O_5 (%) Cut-off Grades, Effective Date July 31, 2011, Edward J. C. Orbock III, SME Registered Member (Base Case is Highlighted)

Cut-off V_2O_5 (%)	Measured + Indicated (Mt)	Measured + Indicated V_2O_5 (%)	Inferred (Mt)	Inferred V_2O_5 (%)
0.050	23.41	0.28	14.45	0.17
0.080	**23.20**	**0.28**	**14.10**	**0.17**
0.100	22.54	0.29	13.95	0.17
0.150	21.11	0.30	9.87	0.19
0.200	18.41	0.32	3.63	0.22
0.250	13.78	0.35	0.36	0.27
0.300	8.90	0.39	0.02	0.31
0.350	5.55	0.43	—	—
0.400	3.15	0.48	—	—

Table 14-6: Cut-off Grade Sensitivity of Louie Hill Inferred Mineral Resource Estimate, (Base Case is Highlighted) Effective Date 20 May 2011, Mark Hertel, P.Geo.

Cut-off V_20_5 (%)	Tons (Mt)	V_20_5 (%)
0.01	7.69	0.27
0.08	**7.67**	**0.27**
0.15	6.98	0.29
0.20	5.51	0.32
0.25	3.97	0.35

14.5 Comments on Section 14

The QPs are of the opinion that the Mineral Resources for the Project, which have been estimated using RC chip and core drill data, have been performed to industry best practices, and conform to the requirements of CIM (2010).

15.0 MINERAL RESERVE ESTIMATES

Mineral Reserve estimates are based on Measured and Indicated Mineral Resources at Gibellini Hill. Because metallurgical test work does not support Measured and Indicated classification for reduced material, the reduced material was set to Inferred within the resource model. All Inferred Mineral Resources were set to “waste”.

No Mineral Reserves have been estimated for Louie Hill.

15.1 Conversion Factors from Mineral Resources to Mineral Reserves

15.1.1 Pit Slopes

Based upon the kinematic and stability evaluations discussed in more detail in Section 16, the pit slope geometry recommendations are summarized in Table 15-1 and displayed in Figure 15-1.

15.1.2 Dilution and Mining Losses

The AMEC mine model is based on the 2011 AMEC resource model. AMEC applied dilution to the resource model to account for the ore-to-waste contact on a block by block basis.

With the exception of edge dilution, no other dilution or losses were applied because the block size at 25 feet x 25 feet x 20 feet accounts for internal dilution and losses anticipated from mining activities.

The dilution script applied to the blocks is as follows. The dilution script applies a skin dilution factor of 0.1 times the block grade to adjacent blocks to account for a five-foot mixing zone between blocks as a result of mining activity. The original block grade value times 0.6 is added to the sum of the four adjacent block grades weighted by 0.1 to arrive at a diluted grade. In the case of inferred blocks, the grade is set to zero.

An example dilution calculation is provided in Table 15-2 with the diluted blocks visually shown in Figure 15-2. The undiluted grade for the sample block in Table 15-2 is 0.18 percent V_2O_5. The 0.18% V_2O_5 grade is multiplied by 0.6 and added to the sum of the surrounding block grades times 0.1. The diluted block grade is calculated at 0.168% V_2O_5.

Table 15-1: Recommended Pit Design Geometry

Pit Sector	Dip Direction	Failure Mode	BFA (degrees)	IRA (degrees)	
				Single Bench	Double Bench
NE	232	Wedge	55	31	39
NNW	154	Wedge	63	34	42
NWW	111	Wedge	58	32	39
S	13	Wedge	47	28	32
SE	311	Wedge	48	29	34
SW	52	Wedge	50	29	35

Figure 15-1: Pit Design Sectors Overlain on the Preliminary Assessment Pit

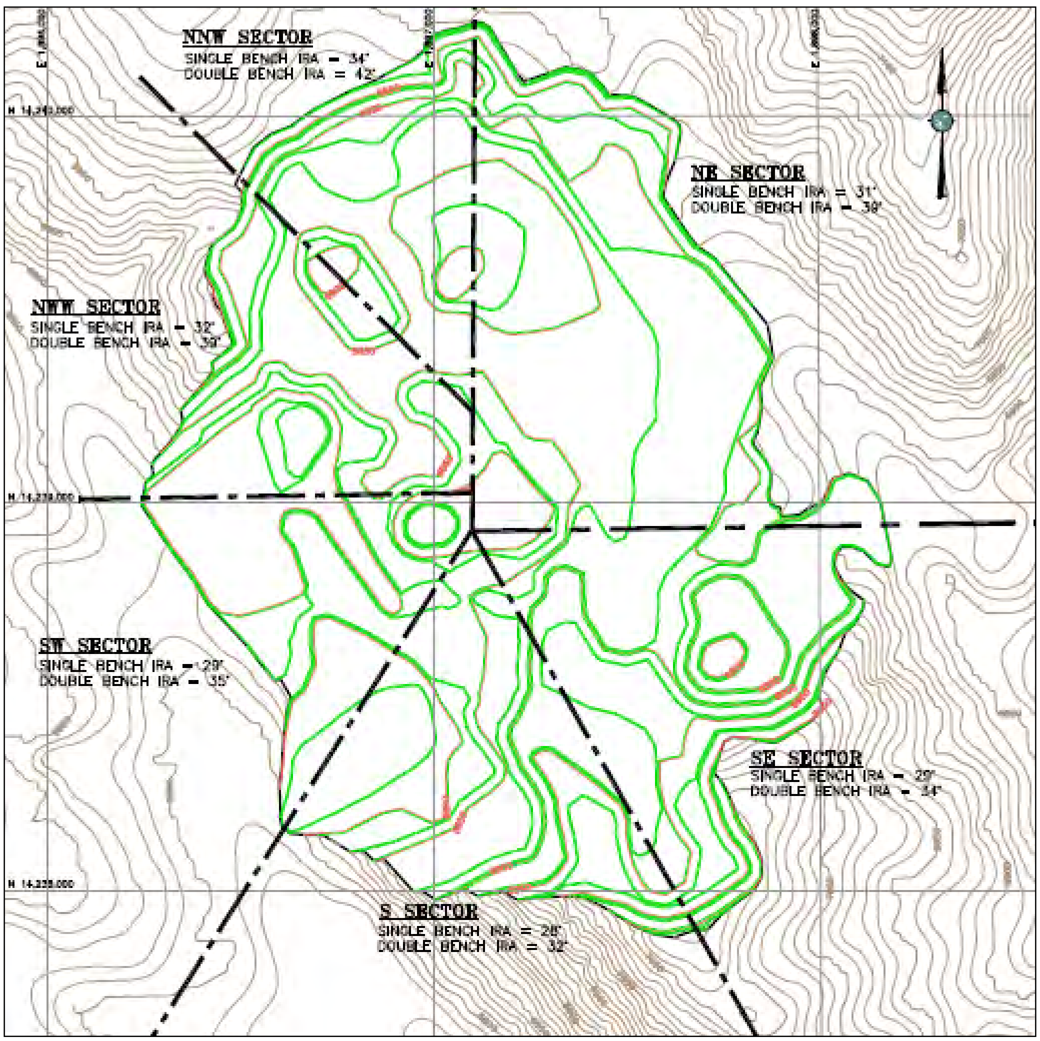
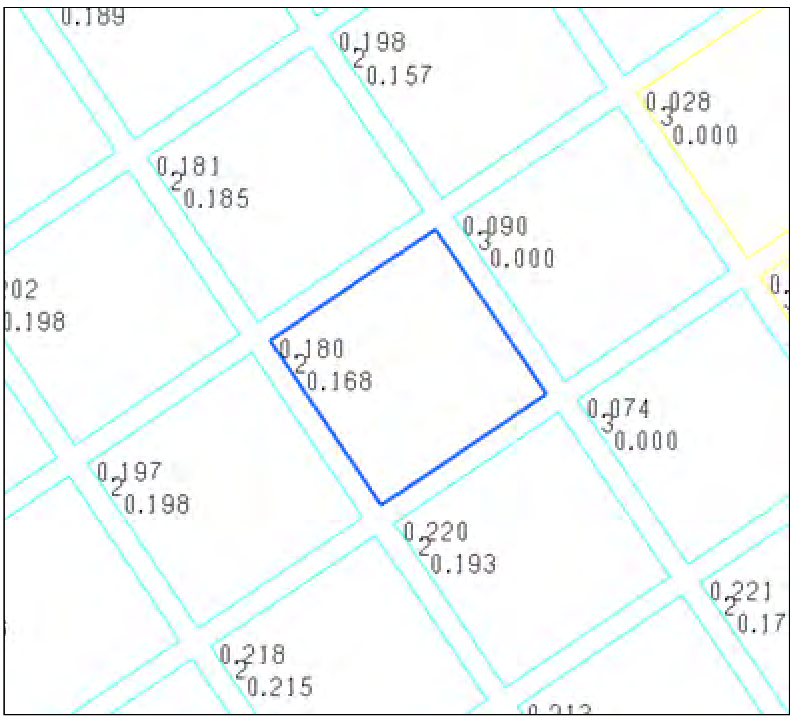


Table 15-2: Sample Dilution Calculation

	Grade	Dilution Factor
Block Grade	0.18	0.6
Block Row +1	0.18	0.1
Block Row -1	0.22	0.1
Block Column -1	0.20	0.1
Block Column +1	0.00*	0.1
Diluted Grade	0.17	

*Block category is inferred (3) and the grade is set to 0%

Figure 15-2: Dilution Script Example



Due to the continuity of the Gibellini orebody, little ore loss occurred as a result of applying the dilution script. Specifically, the oxide material was not downgraded at all while only a 2.5 percent reduction in contained metal above the internal cut-off for the transition material occurred.

15.1.3 Mining Inputs

Open pit mining optimization inputs for the Gibellini Project were based on an open pit bulk mining method assuming a three million ton per year throughput rate. Contract mining was assumed for a contractor utilizing a small equipment fleet (Table 15-3).

Table 15-3: Mining Inputs

No.	Criteria	Gibellini 2011 Feasibility
15	Mining method	Bulk Open Pit, Contract Mining
16	Average mining cost ($/t)	Contract rate = $2.34/t Owners costs = $0.26/t Total Mining cost = $2.60/t Waste Mining Cost = $2.50/t Ore Mining Cost = $2.64/t
17	Capital	Not included in pit optimization.
18	Sustaining Capital	Not included in pit optimization due to contract mine basis & short mine life, i.e. 7 years
19	Design pit slope parameters (IR angles by sector and single/double bench configuration)	OSA, Double Bench (40') NE Sector - 39 NNW Sector - 42 NWW Sector - 39 S Sector - 32 SE Sector - 34 SW Sector – 35

Truck and shovel sizes were estimated at no larger than 100 ton trucks and 14.5 cubic yard front-end loaders (FELs).

Open-pit contract mining costs were estimated at $2.34 per ton and Owner's costs were estimated at $0.26 per ton for a total mining cost of $2.60 per ton mined. Due to a longer ore haul than waste haul, the proportional unit rate mining cost for ore was estimated at $2.64 per ton and waste at $2.50 per ton. No sustaining capital was added to the unit mining cost because the mine fleet is contract-owned and Owner equipment is not replaced due to the short mine life.

15.1.4 Process Inputs

Process design inputs were based on acid heap leaching crushed vanadium ores with dilute sulfuric acid and utilizing a solvent extraction (SX) plant to recover the vanadium. Initial production rates are assumed at 3.0 million tons leached per year.

The $8.90 per ton process optimization cost was based on costs developed in the 2008 PA, and is adjusted for 2011 consumable pricing. To the base process cost of $8.9 per ton, $0.54 per ton was added to account for 100 percent loader rehandle from stockpile and $0.47 per ton was added to account for pad replacement and process sustaining capital. To account for the incremental ore haul cost ($2.64–$2.50), $0.14 per ton was added to the unit process cost. In addition to process related costs, $0.67 per ton was added to account for a $2.0 million per year G&A cost and $0.29 per ton was added to account for closure costs. The total process cost utilized for pit optimization was $11.01 per ton leached. A summary of the process inputs is presented in Table 15-4.

Table 15-4: Process Inputs

No.	Criteria	Gibellini 2011 Feasibility Study
20	Process Type	Crushed acid heap leach
21	Production rate	3 Mt/year or 8,220 t/d
22	Process plant design/feed basis (direct, batch, via stockpile)	100% direct loader feed to primary hopper with a 992 Loader
23	Stockpile reclaim cost	100% reclaimed from stockpile at $0.54/t
24	Process Operating Cost	$8.90/t
25	Process Sustaining Cost	$0.47/t
26	Incremental Ore Haul Cost	$0.14/t
27	G&A Cost at design capacity	$0.67/t, $2 M annual spend
28	Closure Cost at design capacity	$0.29/t processed

15.2 Mineral Reserves Statement

The Qualified Person for the Mineral Reserve estimate is Kirk Hanson, P.E., an AMEC employee. Mineral Reserves are summarized in Table 15-5.

15.3 Factors That May Affect the Mineral Reserve Estimate

Factors that may affect the Mineral Reserve estimate include:

- During the course of the study, American Vanadium identified a calcium boundary at 2.5 percent calcium. American Vanadium contoured this shape and identified that none of the metallurgical holes penetrated it; consequently, the met columns are in relatively benign material. American Vanadium also noted that the 2.5 percent calcium contour extends into the base of the transition ore included in the mine plan; specifically, in the south–central portion of the deposit the 2.5 percent calcium contour protrudes into the transition ore. This is a Project risk due to the elevated calcium levels and likely elevated acid consumption for this material
- The regulatory permitting process for a vanadium heap leach project may require additional geochemical baseline data collection and closure planning, as this type of project has not been permitted before in the State of Nevada. Although similar to a copper heap leach, also limited in the State of Nevada, no specific regulatory guidelines or procedures have been established for this type of process and therefore agency concurrence with data collection protocols and the determination of data adequacy and closure design may be subject to additional reviews and revisions.

Table 15-5: 2011 Gibellini Hill Mineral Reserve Estimate, Effective Date 31 August 2011, K. Hanson P.E.

Mineral Reserve Class	Oxidation State	Cut-off Grade (V_2O_5%)	Tons (Mt)	V_2O_5 (%)	V_2O_5 (Mlbs)
Proven	Oxide	0.15	3.77	0.26	19.46
	Transition	0.13	3.90	0.37	29.05
Probable	Oxide	0.15	5.83	0.25	29.42
	Transition	0.13	6.47	0.33	42.59
Total Proven and Probable	*varies*	*varies*	*19.97*	*0.30*	*120.52*

Notes to Accompany Mineral Reserves Table

1. Mineral Reserves are contained within a pit created with the Lerchs-Grossmann (LG) algorithm completed at a $6.5 per pound V_2O_5 price. The optimization mining cost was $2.50/t mined. An average processing cost of $10.05 per ton was applied which included $8.90 per ton for processing, $0.54 per ton for rehandle, $0.47 per ton for pad replacement costs, and $0.14 per ton for an incremental ore haul cost. G&A and closure costs were applied at $0.67 per ton and $0.29 per ton processed respectively. Process recoveries varied by rock type. For oxide ore a 60 percent recovery was applied and for transition ore a 70 percent recovery was applied. A shipping and conversion cost of $0.374 per pound produced was also applied. Overall slope angles ranged from 32 degrees to 42 degrees
2. The life of mine strip ratio is 0.22:1 (waste:ore).
3. Rounding as required by reporting guidelines may result in apparent summation differences between tons, grade and contained metal content
4. Tonnage and grade measurements are in US units. Grades are reported in percentages.

- Because the Project is most sensitive to metal price, vanadium selling price is a risk for the Project. The Roskill estimated average project selling price of $10.95 per pound is significantly higher than the original study assumption of $6.50 per pound. At a $6.50 per pound selling price, the project has a near breakeven after tax NPV@7%. Obtaining the Roskill estimate pricing will depend on access to markets including American Vanadium's ability to secure long-term vanadium selling contracts.
- An ongoing bench-scale column test is producing battery grade electrolyte. There is an opportunity to improve the project economics by producing and marketing a battery grade electrolyte which sells at a premium to V_2O_5.

15.4 Comments on Section 15

Mineral Reserves have been modified from Mineral Resources by taking into account geologic, mining, processing, and economic parameters and therefore are classified in accordance with the 2010 CIM Definition Standards for Mineral Resources and Mineral Reserves.

16.0 MINING METHODS

16.1 Geotechnical Considerations

The proposed pit limits of the oval-shaped pit are approximately 2,275 feet by 1,650 feet in the north–south and east–west directions, respectively. The maximum excavation depth is anticipated to be approximately 180 feet.

Stability evaluation of the pit slopes included evaluation of kinematics as well as limit equilibrium stability of the ultimate overall slopes of each pit sector. The kinematic evaluation was performed using data from both the oriented core logs and surface mapping provided by American Vanadium. A 30 percent probability of bench-scale failure (POF) and factor or safety of 1.2 or greater was considered acceptable for the pit slopes at Gibellini due to their relatively low overall slope height.

It should be noted that maintenance will be required in order to keep the catch benches clear of debris. Lower probability of failures, and flatter inter-ramp slopes, should be considered in areas above haul roads or other in pit facilities. The design bench face angles are the lowest in the southern sectors. Bench-scale wedge-type failures were shown to be the most critical mode of slope instability for all sectors.

The pit was divided into six sectors based upon the mean orientations of the pit slopes. The bench height is typically controlled by the size of the mining equipment, which in the present case is assumed to be sized for a single and double bench height of 20 feet and 40 feet, respectively.

Recommended pit slope angles were summarized in Table 15-1 in Section 15.

16.2 Pit Design

Pit optimization inputs were determined by a collaborative effort between AMEC and American Vanadium at the onset of the project. Note that because the optimization work preceded the final design work and capital and operating cost estimates by several months; as a result, there are variances between the initial planning inputs and the final study estimates.

American Vanadium set the initial commodity price of \$6.5 per pound V_2O_5 and project milestones based on an early internal assessment of the vanadium market and permitting requirements.

Royalties are based on the Dietriech royalty, which is a graduated net smelter return (NSR) royalty. The initial payment is 2.5 percent of NSR until royalty payments reach a total of $3 million, whereupon the royalty decreases to 2.0 percent. For optimization purposes, a NSR of two percent was assumed.

A 20-foot bench was selected based on utilizing small mining equipment in the range of 100 ton trucks and 14.5 cubic yard loaders. The 14.5 cubic yard loaders' optimal bench height is approximately 20 feet. Note that double benching is assumed between catch benches.

Pit ramps are designed at 85 feet for two-way traffic and 50 feet for one-way traffic in the pit bottoms based on a mining truck with an operational width of no larger than 20 feet, i.e. 100 ton class-size truck. Ramps assume a maximum gradient of 10 percent. The minimum mining width is set at 75 feet in the pit bottoms and 100 feet on benches to account for the mining berm.

The mining, process, dilution and geotechnical optimization parameters are as discussed in Section 15.

The pit by pit graph shown in Figure 16-1 was used to select an optimization surface to guide pit design. Pit 21, the revenue factor 1 pit formed at the base V_2O_5 price of $6.50 per pound of V_2O_5, is the break even pit and was selected to guide mine designs.

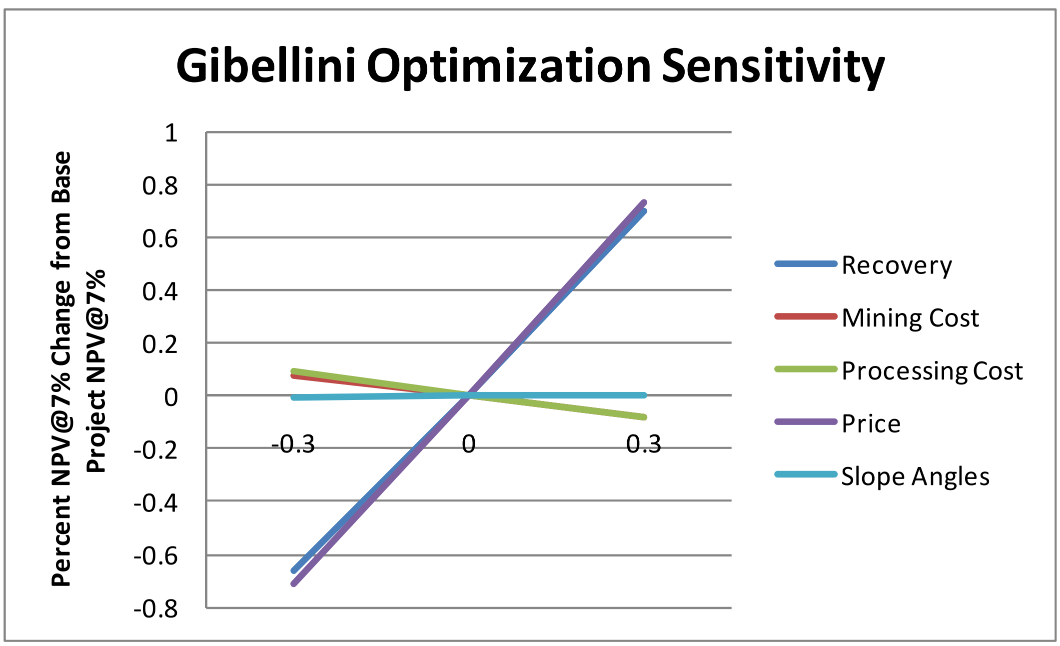
Sensitivities were run against the base case Whittle® revenue factor 1 pit to assess sensitivity to mine operating costs, process operating costs, V_2O_5 price, recovery, and slope angles. The sensitivities were run at ±30 percent for cost drivers and ±5 degrees for slope angles.

Based on the sensitivity work, the Project is most sensitive to V_2O_5 price and recovery (Figure 16-2), which is typical for most projects. With a 30 percent reduction in V_2O_5 price to $4.55 per pound, the Project NPV@7% decreases by 71 percent. Conversely, with a 30 percent increase in V_2O_5 price to $8.45 per pound, the Project NPV@7% increases by 74 percent.

Project NPV@7% is much less sensitive to changes in processing and mining costs with ±30 percent changes to operating costs resulting in less than ±10 percent changes to the project NPV@7%. Project NPV@7% is least sensitive to changes in slope angles with ±5 degree changes to slope angles resulting in a ±1 percent variation to Project NPV@7%.

Figure 16-1: Whittle® Pit by Pit Graph

Figure 16-2: Pit Optimization Sensitivity Spider Graph



Compared to the revenue factor 1 pit, the design pit included an additional 12.0 percent total tons. The 12.0 percent addition to total tons is just outside the generally accepted 10 percent upper threshold; however, because the Gibellini pit is relatively small it is not unusual to add extra tons during the design process to allow for minimum mining widths. In addition, the factor 1 pit strip ratio is so low initially that a small addition of waste for minimum mining widths increases the waste by a large relative percent.

Ore totals compared favorably between the revenue factor 1 pit and the design pit with a very slight positive gain in ore tons due to the addition of dilution material for the design pit; albeit, at a slightly lower grade.

16.3 Production Schedule

Utilizing the optimized pit, AMEC design an ultimate pit inclusive of three internal phases. The ultimate pit is shown in Figure 16-3 with a breakdown of tonnage by phase shown in Table 16-1.

AMEC scheduled the phases to provide the highest valued ore to the leach pad in the early years. Additionally, the phases were scheduled to provide three million tons per year of ore to the leach pad while limiting bench advance to less than 10 benches per year. The mine schedule is shown in Table 16-2.

The basis for mining the Gibellini deposit is contract mining. AMEC completed a Request for Quotation (RFQ) document and provided it to multiple contract mining firms who service the Nevada region. After completing a check of the two bid packages submitted, the contract mining firm that provided the lowest cost bid proposal was selected for use as the cost estimate basis in the Feasibility Study.

In total, the mining contractor's annual personnel number requirements are 21. A staff of six is employed to accomplish the Owner's mining tasks. In total, the mine group includes 27 people.

Due to the relatively small size of the Gibellini mine operation and to increase productivity, a single shift schedule will be operated at the mine. Crusher re-handle will be done on a continuous basis operating a two-shift schedule, seven days per week for 24 hour per day coverage.

Figure 16-3: Ultimate Pit

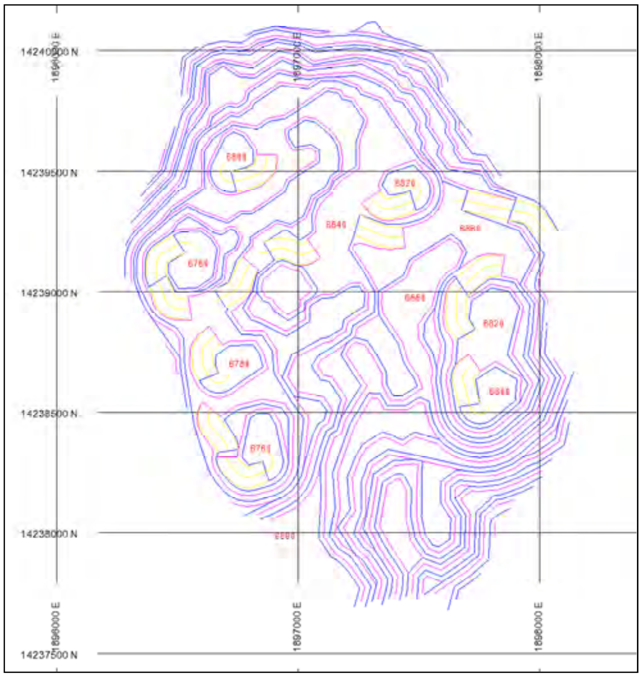


Table 16-1: Phase Summary

Period	Total	Waste	Ore	V_2O_5	V_2O_5	Strip Ratio	Value (lbs
	(Mt)	(Mt)	(Mt)	(Mlbs)	(%)	(wst:ore)	recovered/t)
Phase I	4.98	0.36	4.62	29.71	0.32%	0.08	3.9
Phase II	5.50	0.69	4.81	29.66	0.31%	0.14	3.5
Phase III	5.63	0.49	5.14	32.21	0.31%	0.10	3.8
Phase IV	8.16	2.76	5.40	28.94	0.27%	0.51	2.4
Total	24.27	4.30	19.97	120.52	0.30%	0.22	3.3

Table 16-2: Mine Production Schedule

Period	Total	Rock Waste	Oxide Ore		Transition Ore		Total Ore		V_2O_5
	(Mt)	(Mt)	(Mt)	(%V_2O_5)	(Mt)	(%V_2O_5)	(Mt)	(%V_2O_5)	(Mlbs)
Yr 1, Q1	0.64	0.05	0.59	0.23	—	—	0.59	0.23	2.68
Yr 1, Q2	0.79	0.04	0.75	0.25	—	0.14	0.75	0.25	3.80
Yr 1, Q3	0.81	0.06	0.72	0.26	0.03	0.46	0.75	0.27	4.05
Yr 1, Q4	0.82	0.07	0.63	0.27	0.12	0.46	0.75	0.31	4.59
Yr 2, Q1	0.81	0.06	0.32	0.29	0.43	0.47	0.75	0.39	5.90
Yr 2, Q2	0.78	0.03	0.31	0.31	0.44	0.45	0.75	0.39	5.88
Yr 2, Q3	0.81	0.06	0.20	0.29	0.55	0.41	0.75	0.38	5.66
Yr 2, Q4	0.88	0.13	0.68	0.28	0.07	0.47	0.75	0.30	4.47
Yr 3	3.50	0.50	1.77	0.26	1.23	0.37	3.00	0.31	18.31
Yr 4	3.18	0.18	1.81	0.24	1.19	0.36	3.00	0.29	17.37
Yr 5	3.76	0.76	0.73	0.26	2.27	0.36	3.00	0.33	20.06
Yr 6	4.16	1.16	0.82	0.21	2.18	0.28	3.00	0.26	15.54
Yr 7	3.33	1.20	0.27	0.21	1.86	0.30	2.13	0.29	12.20
Total	24.27	4.30	9.60	0.25	10.37	0.35	19.97	0.30	120.52

16.4 Mining Equipment

AMEC completed an independent estimate of equipment requirements based on the 2011 mine schedule to verify the equipment fleet indicated by the contract mining firm. AMEC believes that the equipment fleet proposed by the mine contractors is appropriate for achieving the mine schedule. Equipment requirements are summarized in Table 16-3.

Equipment average fuel usage was provided by the mining contractor. An additional five percent of the total equipment fuel usage is estimated to account for ancillary equipment fuel usage. On average, the mine fleet will consume 540,000 gallons per year of diesel fuel.

16.5 Blasting and Explosives

The primary mine consumables include ANFO, the blasting agent, and diesel fuel. Utilizing a powder factor of 0.25 pounds per ton for blasting soft rock, annual ANFO usage is approximately 400 tons per year

16.6 Comments on Section 16

In the opinion of the QPs, the following conclusions are appropriate:

- The proposed project will be a conventional open-pit operation with an annual throughput rate of three million ton per annum
- The mine plan mines four separate phases from one open pit at Gibellini Hill
- The SMU block size of 25 feet x 25 feet x 20 feet reflects the selectivity of the proposed open pit mining rate. The bench height of 20 feet, minimum mining width of 75 feet in the pit bottoms and 100 feet on benches, and pit ramps sizes at 85 feet for two-way traffic and 50 feet for one-way traffic are appropriate to the mine design envisioned
- Mining will be carried out using 14.5 cubic feet front-end loaders and trucks. Mining equipment requirements were based on the mine production schedule and equipment productivities, and included consideration of workforce and operating hours. The fleet is appropriate to the planned production schedule

Table 16-3: Contract Mine Equipment

Description/Equipment	Make	Model	2013	2014	2015	2016	2017	2018	2019
Drilling									
Blasthole Drill	Atlas Copco	DM45	1	1	1	1	1	1	1
Blasting									
ANFO Truck	International	4900	1	1	1	1	1	1	1
Skid Steer Loader	Caterpillar	226	1	1	1	1	1	1	1
Hauling									
Haul Trucks	Komatsu	785-7	5	5	5	5	5	5	5
Loading									
Wheel Loader*	Caterpillar	992G	2	2	2	2	2	2	2
Crusher Rehandle									
Wheel Loader	Caterpillar	988F	1	1	1	1	1	1	1
Support									
Dozer	Caterpillar	D10R	2	2	2	2	2	2	2
Water Truck	Caterpillar	773B	1	1	1	1	1	1	1
Motor Grader	Caterpillar	16H	1	1	1	1	1	1	1

* Includes one backup loader

17.0 RECOVERY METHODS

The design for the process plant is based on processing the mined material through a heap leach operation using heap-leach technology and standard proven equipment.

Commercial heap leaching and solvent extraction (SX) recovery of vanadium ores has not been done before; nonetheless, heap leaching and SX recovery are common technology in the mining industry. The most notable examples are the multiple copper, nickel and cobalt heap leach projects that utilize an acid leach solution to mobilize the metal followed by recovery in a SX plant, which is then followed by electro-winning. The Gibellini process applies the same acid heap leaching and SX technology to recover vanadium. However, instead of electro-winning to produce a final product, the Gibellini process utilizes an acid strip followed by precipitation to produce a final product.

17.1 Plant Design

The processing method envisioned for Gibellini will be to feed ore from the mine via loader to a hopper that feeds the screening and crushing plant. The screen will send any material greater than a third-inch and less than four inches in size to the cone crusher (plus four inch material will be sent to stockpile for further treating). The crushed material will recycle to the screen feed belt, thus crushing in closed circuit. The minus half-inch ore will be fed to the agglomerator where sulfuric acid, flocculent (agglomeration aid) and water will be added to achieve proper agglomeration. The agglomerated ore will be transported to a stacker on the leach pad, which will stack the ore to a height of 15 feet. Once the material is stacked and sufficient material accumulated to distribute sprinklers onto the leached material, solution will be added to the leach heap at a rate of 0.0025 gallons per minute per square foot. The solution will be collected in a pond and this pregnant leach solution (PLS) will be sent to the process building for metal recovery.

The PLS will be treated with iron to convert all of the vanadium in solution from the vanadate (VO_3^-) form to the vandyl (VO^{+2}) form, which will be preferentially loaded onto the organic phase in the extraction phase of treatment. Solvent extraction mixers-settlers will be used to recover the vanadium onto the organic phase and to produce a vanadium depleted aqueous solution (raffinate). The raffinate will then be returned to the leach pad to continue to leach the vanadium remaining in the heap material. The loaded organic phase from the extraction will then be contacted in a separate set of mixer-settlers called the strip circuit. Here the vanadium will be pulled from the organic phase into the new aqueous phase. The stripped organic will then be returned to the extraction circuit where it will be re-loaded with vanadium. The stripped vanadium solution will then be oxidized to vanadate with sodium chlorate and ammonia will be used to form ammonium metavanadate (AMV). Sulfuric acid will be added to the AMV and a precipitate will be formed. This precipitate will be settled in a thickener and the thickened material will be sent to a centrifuge. The thickener overflow will be recycled back to the strip circuit where it will be loaded with vanadium again.

Approximately 79.5 million pounds of V_2O_5 will be e produced from Gibellini leaching operations at an average recovery of 66 percent. Table 17-1 provides a summary of the metal plan by period.

Metal produced from leaching operations generally increases from the first quarter of Year 1 to Year 5 as lower grade and lower recovery oxide ores are supplanted by higher grade and higher recovery transition ores. Following Year 5, the overall deposit grade drops; consequently, metal production likewise drops. As seen in Figure 17-1, pounds V_2O_5 recoverable and V_2O_5 produced are mostly coincidental lines due to a steep initial recovery curve and a relatively short leach cycle of 90 days. That is, the majority of the metal is produced within the same reporting period as it is placed on the leach pad.

17.2 Process Flow Sheet

A process flowsheet schematic is included as Figure 17-2. Figure 17-3 presents the design of the crusher and heap leach circuit design, and Figure 17-4, the solvent extraction circuit design.

17.3 Equipment

The process design criteria for the crushing circuit are shown in Table 17-2. The process design criteria for the classification equipment are shown in Table 17-3.

17.4 Labor

A total of nine salaried staff will be required. For each shift, a total of 12 hourly staff will be required. The processing operators will work a 12 hour shift on a rotating basis, and the mechanics will work 10 hour shifts four days per week. Leach helpers will work days while the leach pad operators will work on a rotating shift. Crusher operators and helpers will work rotating shifts. The laboratory technicians will work rotating shifts. The remaining staff works 10 hours shifts. Foremen will work a rotating shift with the hourly crews.

The senior staff will work weekend duty with the other senior staff on site so that there is management coverage during the weekends.

Table 17-1: Metal Plan

Period	Oxide Ore		Transition Ore		Total Ore		V_2O_5	Recovery	V_2O_5
	(kt)	(% V_2O_5)	(kt)	(% V_2O_5)	(kt)	(% V_2O_5)	(cont. kbls)	(%)	(rec. kbls)
Yr 1, Q1	588	0.23%	-		588	0.23%	2,684	56%	1,503
Yr 1, Q2	750	0.25%	0	0.14%	750	0.25%	3,799	59%	2,236
Yr 1, Q3	723	0.26%	27	0.46%	750	0.27%	4,046	60%	2,443
Yr 1, Q4	626	0.27%	124	0.46%	750	0.31%	4,586	62%	2,839
Yr 2, Q1	322	0.29%	428	0.47%	750	0.39%	5,897	66%	3,864
Yr 2, Q2	306	0.31%	444	0.45%	750	0.39%	5,879	67%	3,928
Yr 2, Q3	204	0.29%	546	0.41%	750	0.38%	5,660	68%	3,852
Yr 2, Q4	678	0.28%	72	0.47%	750	0.30%	4,474	63%	2,823
Yr 3	1,772	0.26%	1,228	0.37%	3,000	0.31%	18,310	65%	11,890
Yr 4	1,808	0.24%	1,192	0.36%	3,000	0.29%	17,374	65%	11,297
Yr 5	729	0.26%	2,271	0.36%	3,000	0.33%	20,062	68%	13,620
Yr 6	822	0.21%	2,178	0.28%	3,000	0.26%	15,542	68%	10,578
Yr 7	273	0.21%	1,859	0.30%	2,131	0.29%	12,202	70%	8,599
Total	9,599	0.25%	10,370	0.35%	19,969	0.30%	120,515	66%	79,473

Figure 17-1: Annual Metal (V_2O_5) Production

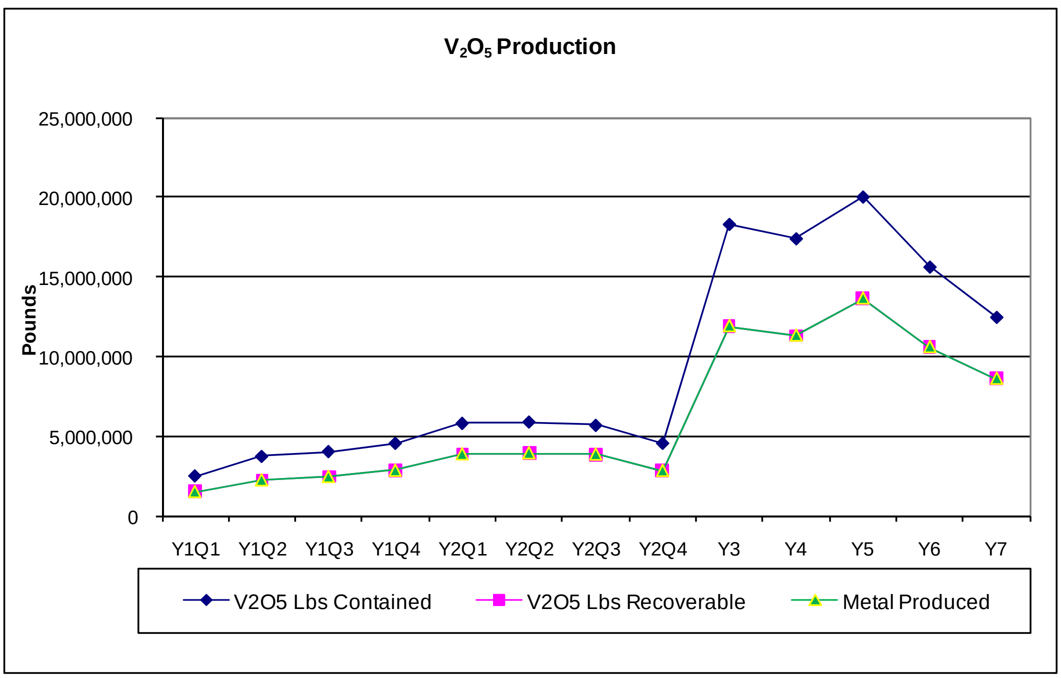


Figure 17-2: Flowsheet Design Schematic

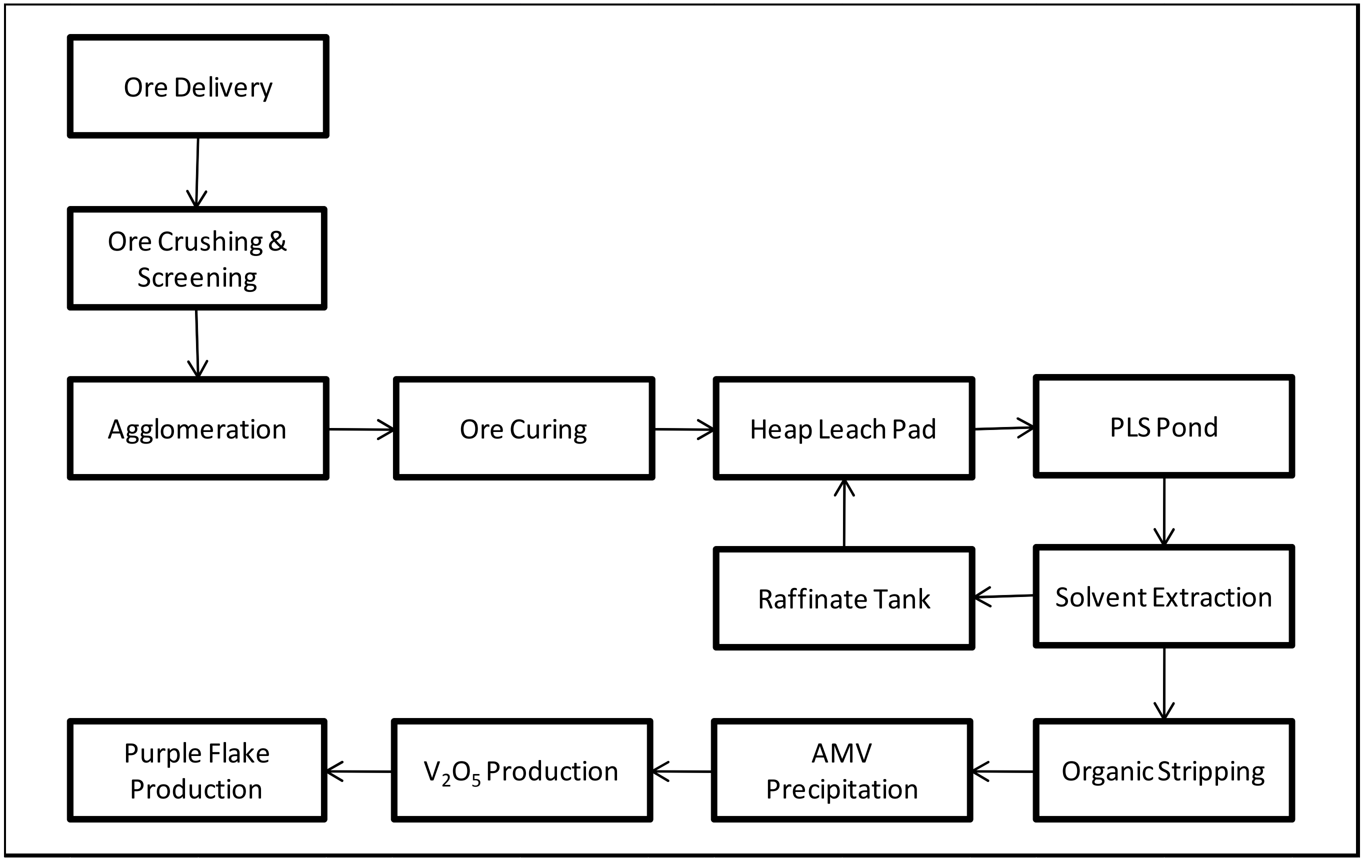


Figure 17-3: Crusher and Heap Leach Design Schematic

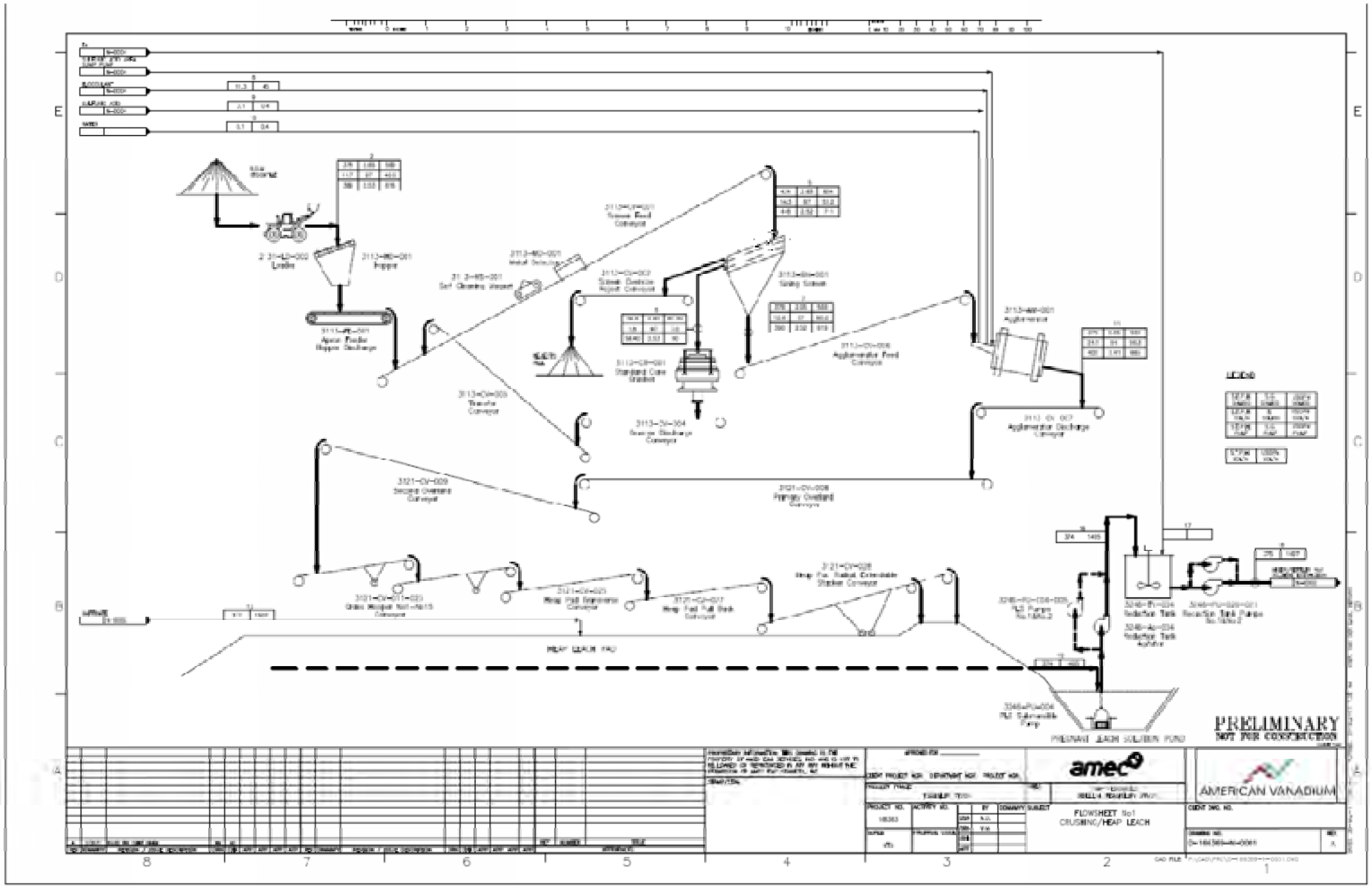


Figure 17-4: Solvent Extraction Design Schematic

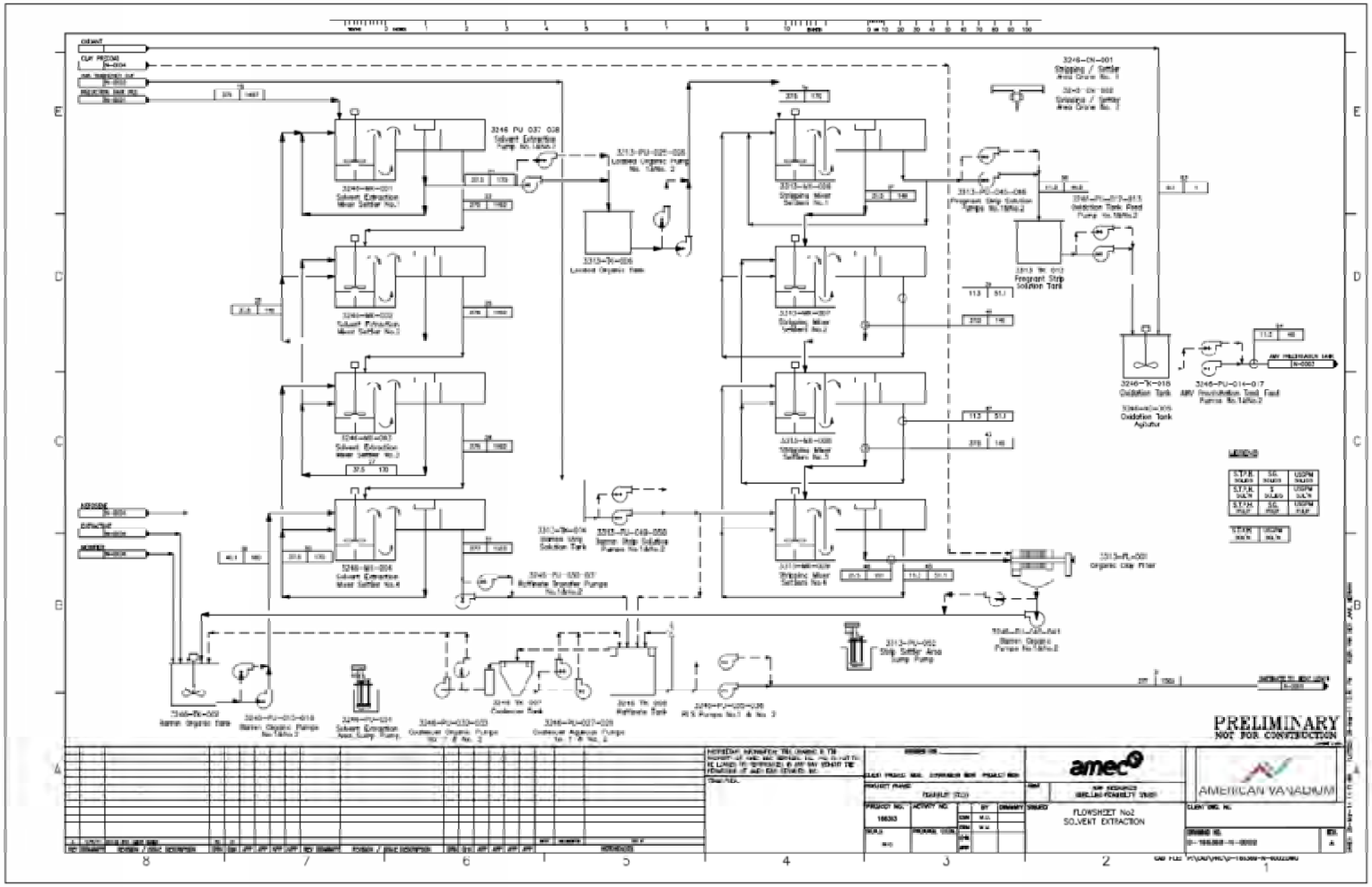


Figure 17-5: Precipitation and Packaging Design Schematic

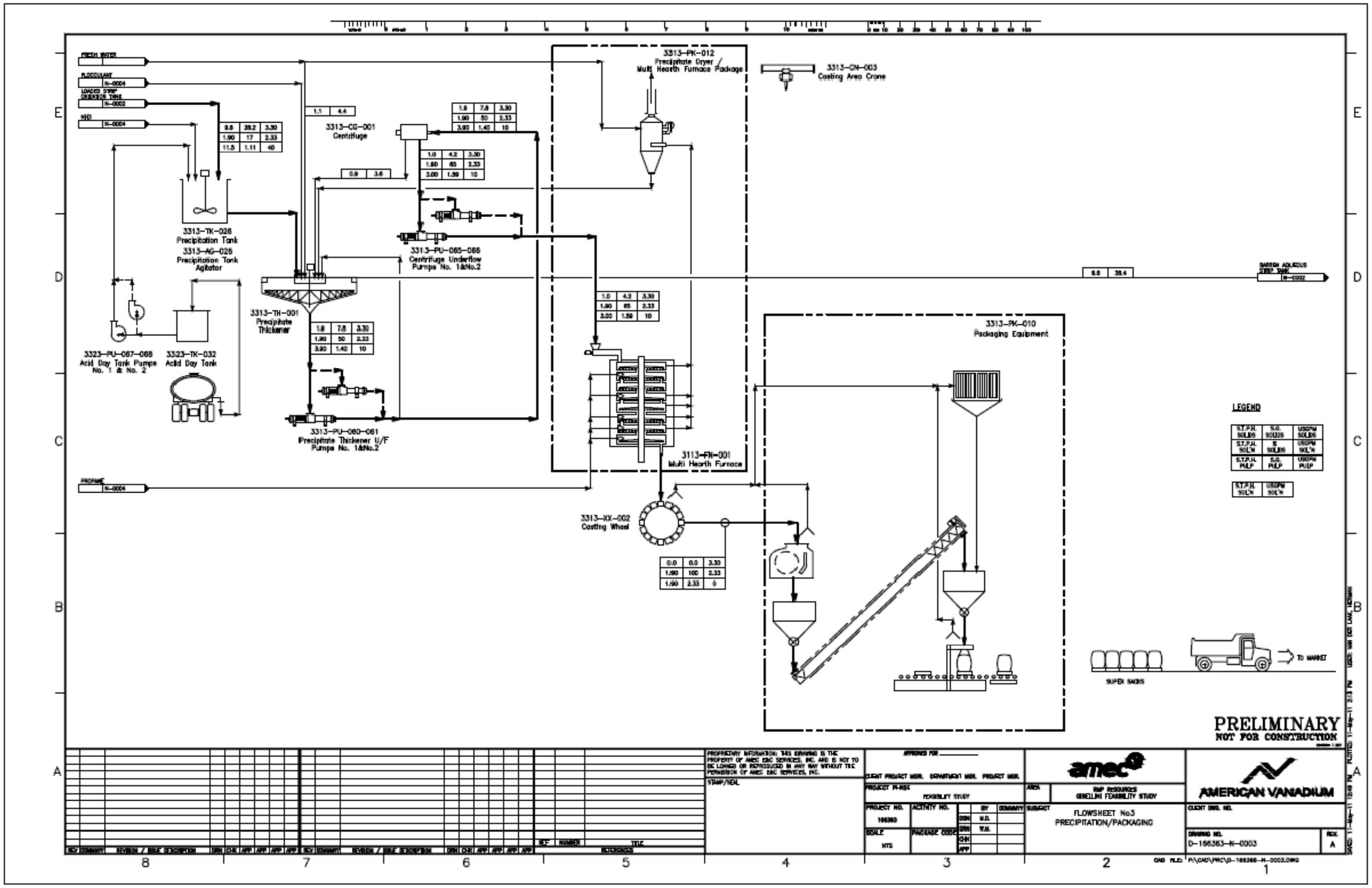


Figure 17-6: Reagent Design Schematic

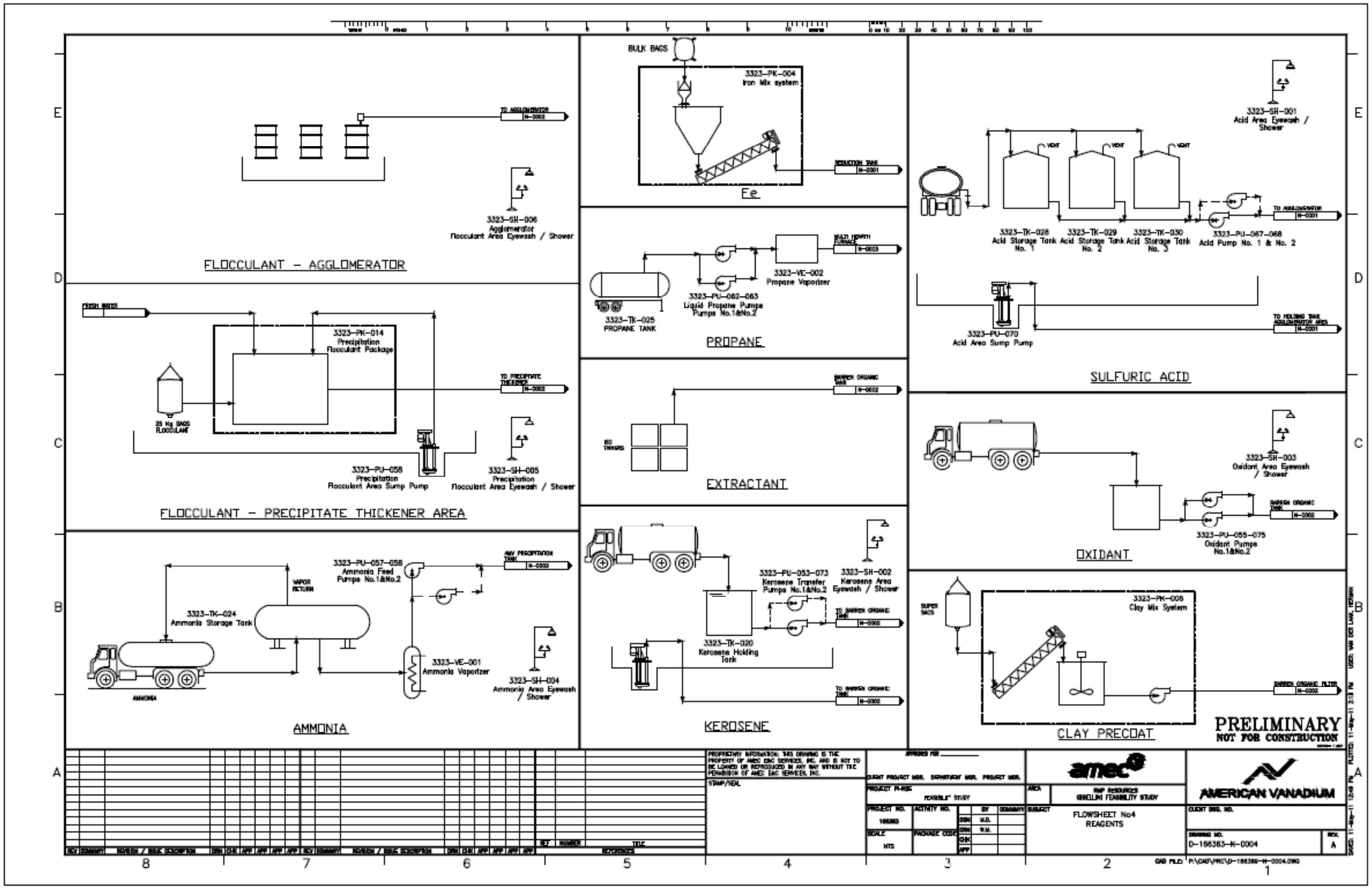


Table 17-2: Process Design Criteria – Crushing

Parameter	Units	Value	Source
Run-of-mine top size	mm	305	
	in	12	
Feed F_{80}	mm	152	AMEC Americas
	in	6	
Feed F_{50}	mm	127	AMEC Americas
	in	5	
Broken ore bulk density	g/cc	1.59	AMEC Americas
Crushing plant availability	%	75	AMEC Americas
Throughput (Design)			
Annual	t/a	3 000 000	American Vanadium
	st/a	3 306 933	
Daily	t/d	10 959	Calculated
	st/d	12 080	
Hourly (Operating)	t/h	457	Calculated
	st/h	503	
Design maximum	t/h	571	
	st/h	629	
Grizzly	t	75	AMEC Americas
	st	83	
Dump Pocket Capacity	t	91	AMEC Americas
	st	100	
Dump Pocket Feed Loader	model	Caterpillar 992D	AMEC Americas
Crusher type		Grizzly	AMEC Americas
Aperture	mm	305	AMEC Americas
	in	12	
Feed size passing	mm	150	AMEC Americas
	in	6	
Efficiency	%	90	AMEC Americas

Table 17-3: Process Design Criteria – Classification

Parameter	Units	Value	Source
Screen		double deck	AMEC Americas
Type	mm	100	AMEC Americas
Aperture	in	4	AMEC Americas
Aperture	mm	25	AMEC Americas
	in	1	AMEC Americas
Efficiency	%	85	AMEC Americas
Spray water for dust control	m^3/h	.8	AMEC Americas
	US gpm	3.5	
Cone Crusher			
Moisture content	%wt	1.5 to 3	AMEC Americas
Top size	mm	152	AMEC Americas
	in	6.0	
Circuit availability	%	75	AMEC Americas
Tramp steel protection required	y/n	y	AMEC Americas
Tramp relief	y/n	y	AMEC Americas
Discharge top size	mm	38	AMEC Americas
	in	1.5	
Discharge P_{80}	mm	25	AMEC Americas
	in	1.0	
Agglomerator			
Availability	%	75	AMEC Americas
Throughput			

Parameter	Units	Value	Source
Annual	t/a	3000 000	AMEC Americas
	st/a	3306 933	
Daily	t/d	10 959	AMEC Americas
	st/d	12 080	
Hourly	t/h	457	AMEC Americas
	st/h	503	
Solids at discharge	%	94	AMEC Americas
pH		acidic	AMEC Americas
Reagents			
Flocculant			
Strength		.50	AMEC Americas
Feed per screen feed		.015	AMEC Americas
SG		1.21	Vendor Data / Information
Acid			
Strength	%	93	AMEC Americas
Feed per screen feed	%	.038	AMEC Americas
SG		1.78	Vendor Data / Information

17.5 Energy, Water, and Process Materials Requirements

17.5.1 Reagents

The following reagents will be required during processing operations:

- Sulfuric acid
- Polymer
- Kerosene
- Diethyl hexa phosphoric acid (DEHPA)
- Tri octyl phosphorous oxide (Topo)
- Ammonia
- Sodium chlorate
- Powdered iron
- Electrical power
- Diesel
- Propane.

17.5.2 Water

Process water gravity will feed from the make-up pond to the raffinate tank located in the process area at a flow rate of 300 gallons per minute. Water will also be pumped from the make-up pond to a 10,000 gallon water truck on average 12.5 times/day.

This water will be pumped at a flow rate of 800 gallons per minute from a submersible pump. During construction, water will be supplied to construction trucks.

17.5.3 Electrical/Power

Electrical and power requirements for the process area were incorporated in both the capital cost allocations and operating cost allocations in Section 21 of this Report.

17.6 Comments on Section 17

In the opinion of the QPs, the following conclusions are appropriate:

- The design for the process plant is based on processing the mined material through a heap leach operation using heap-leach technology and standard proven equipment. Commercial heap leaching and SX recovery of vanadium ores has not been done before; nonetheless, heap leaching and SX recovery are common technology in the mining industry.
- The process design is based on the metallurgical testwork and is appropriate to the crush and recovery characteristics defined for the different oxidation states of the mineralization
- Reagent requirements have been appropriately established for the operational throughput
- Process water requirements have been appropriately considered in the design process. Water will be sourced from wells.
- Power for the process route will be supplied from a new 24.9 kilovolt distribution line to be constructed to the Project.

An ongoing bench-scale column test is producing battery grade electrolyte. There is an opportunity to improve the Project economics by producing and marketing a battery grade electrolyte which sells at a premium to V_2O_5.

18.0 PROJECT INFRASTRUCTURE

18.1 Leach Pad and Pond

The Gibellini heap leach facility will leach minus half-inch crushed and polymer agglomerated vanadium ore from the Gibellini Pit.

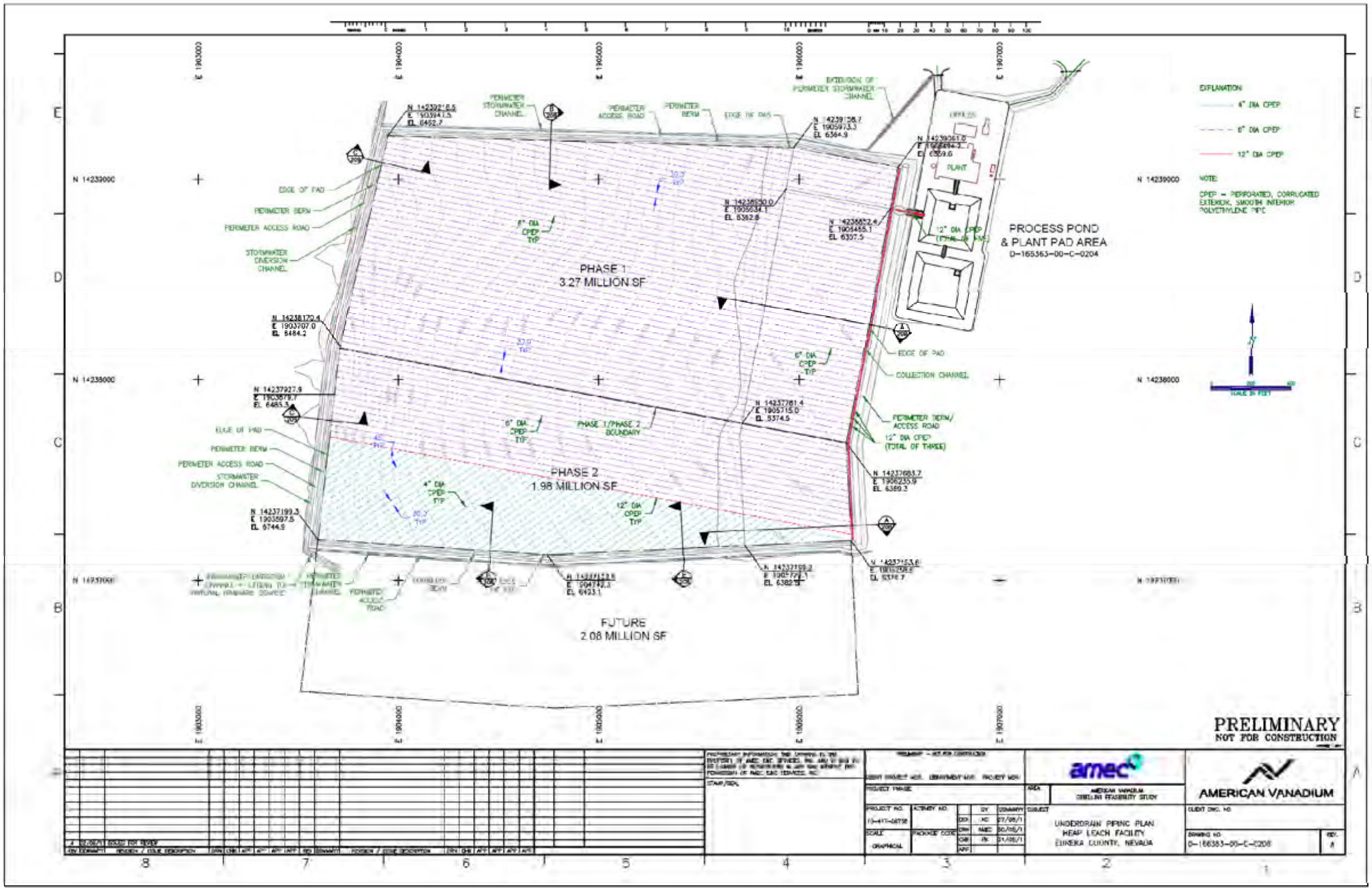
The leach pad will be developed in two phases with the potential to expand to a third phase (Figure 18-1). The interior of the Phase 1 leach pad will cover an area of approximately 3.3 million square feet. Phase 2 covers approximately 2.0 million square feet. An additional 2.1 million square feet of leach pad area has been identified for future expansion. Based on half-inch minus crushed material and using a tonnage factor of 23.5 cubic feet per ton (85 pounds per cubic foot), the Phase 1 and Phase 2 leach pad will accommodate approximately 20 million tons of ore placed to an ultimate height of 150 feet. Each phase, including the future expansion, is sized to accommodate approximately 10.0 million tons.

Individual lifts of leach material will be placed by a radial stacker on the order of 15 feet in height. Setbacks are incorporated into the stacking plan at each lift level to achieve a three horizontal to one vertical (3:1) overall slope. Because of the friable nature of the ore, agglomeration is critical to the percolation characteristics of the leach materials. Heavy equipment access to the placed ore will be with low ground pressure dozers. Barren solution application is expected to be 0.0025 gallons per minute per square foot with a total solution flow to the pad of 1,500 gallons per minute.

The design concept for the leach pad liner system includes a composite lining system consisting of a GCL overlain by an 80 mil high-density polyethylene (HDPE) geomembrane liner. GCL has been used for prepared subbase (low hydraulic conductivity soil layer material) in composite lining systems for leach pad projects in Nevada and is considered equivalent by the Nevada Division of Environmental Protection (NDEP). The HDPE geomembrane liner will be covered with a three foot thick cushioning/drainage layer of liner cover material or overliner. An integrated piping network (underdrain piping) is included in the pad design to enhance solution recovery and limit heads on the liner system. Overliner material will consist of crushed and/or screened rhyolite material.

Pregnant leach solution (PLS) will be collected and transported to the pond system in trapezoidal shaped double lined solution channels. Perforated, corrugated exterior, smooth interior polyethylene pipe (CPEP) will be placed in the channels and covered with drain rock to facilitate solution collection and to prevent leach solution exposure to wildlife. The channels will be double lined with independent leak detection systems.

Figure 18-1: Heap Leach Pad Design Layout



The channel lining system will consist of two 80 mil HDPE geomembrane liners with an intermediate geonet layer to transmit leakage to leak detection risers. The leak detection risers will be located at the PLS pond crest and have overflow pipes that will discharge into the PLS pond.

The process pond system will be located to the east of the leach pad and will consist of a PLS pond and a storm pond. The PLS pond capacity is based on a 48-hour power loss event with a nominal leach solution return rate of 1,500 gallons per minute, plus an operating inventory of two hours at the leach solution return rate, plus direct precipitation from a 100-year, 24-hour storm event, plus two feet of freeboard. The storm pond is designed to contain the runoff/infiltration from a 100-year, 24-hour storm event, plus direct precipitation falling on the pond surface, plus two feet of freeboard.

Both the PLS pond and the storm pond will be double lined with 80 mil HDPE geomembrane liner with an intermediate geonet drainage layer. Any potential leakage in the primary liner will flow to a depressed sump located at the low point in the pond bottom and will be monitored using an inclined riser consisting of an HDPE pipe. This leak detection system eliminates pipe penetrations through the pond lining system.

The leach pad will be sited to minimize cuts and fills and to provide an overall balanced cut to fill earthworks. A small knoll rock outcrop located along the west side of the Phase 1 leach pad, will require removal prior to the construction of the pad. Removal of this knoll will likely require drilling and blasting. Due to the carbonate nature of the rock formation comprising the knoll, it is thought that this material will be suitable for use as part of an evapotranspiration cover (ET cover) layer for facility closure. Carbonate material may help to neutralize residual pH of the acid leached ore at the end of the life of the mine. Therefore, the material removed from the knoll will be stockpiled east of the leach pad for future use as a cover.

Following clearing and grubbing operations and removal of the knoll, mass grading of the leach pad and pond area will be completed. Cuts and fills within the majority of the leach pad will typically range on the order of five feet or less and will consist of a general smoothing of topographic features. The primary areas that will require the majority of the leach pad earthworks are within the down gradient corridor of the facility and along the north and south side of the pads to provide leach pile stability and controlled channel gradients. The down gradient corridor, in addition to the 530-foot wide buttress zone, also includes the collection channel, the perimeter berm and the perimeter access road. Maximum cuts and fills within the down gradient corridor area will range from approximately 20 feet to 24 feet, respectively. The process pond and plant area maximum cuts are expected on the order of 19 feet below existing grades and maximum fills will be on the order of 17 feet.

The facilities are separated from the natural up gradient watersheds by storm water diversion systems designed to safely pass the 100-year, 24-hour precipitation event.

A make-up water pond used to store freshwater for use in leaching activities and for construction water and dust control is constructed northwest and up gradient of the leach pad. The pond is sized to store a maximum of three million gallons of freshwater plus direct precipitation to the pond surface from a 100-year, 24-hour storm event with two feet of freeboard. The pond is single lined with an 80 mil HDPE liner.

The pond has been sited to produce an overall cut to fill earthwork balance. Following clearing and grubbing operations, mass grading of the pond area is completed. The make-up water pond area will require maximum cuts on the order of 23 feet below existing grades and maximum fills on the order of 18 feet.

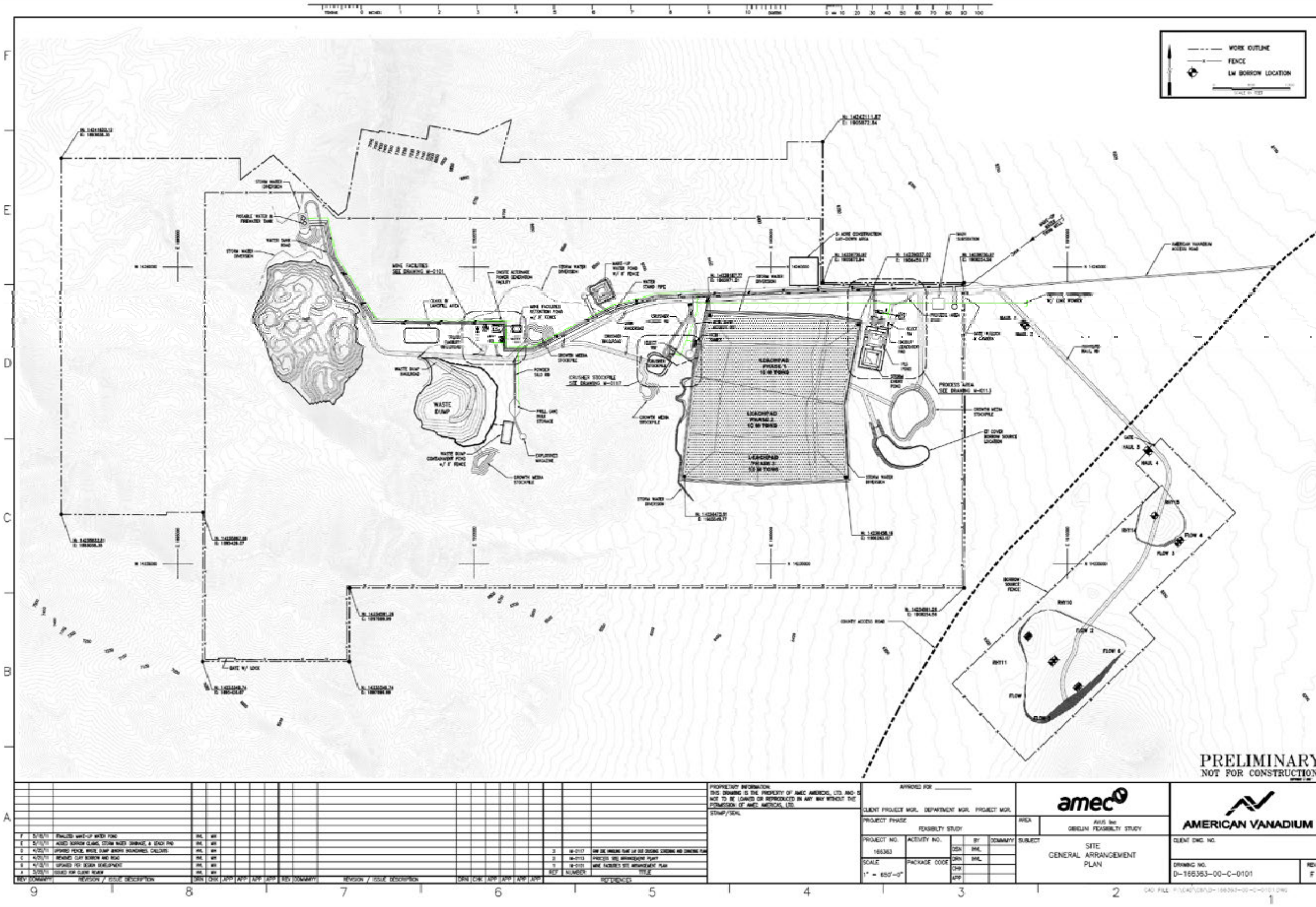
Surface water hydrologic and hydraulic calculations have been performed to establish design peak flows, runoff volumes, channel and underdrain capacities, minimum channel dimensions and slopes required to pass the design peak flows from the on-site storm events and solution applications. The facility layout and off-site runoff diversion system route up gradient runoff around the heap leach facility. Therefore, stormwater considerations are dictated by direct precipitation falling on the facilities.

18.2 On-Site Mine Infrastructure

Infrastructure to support the Gibellini project will consist of site civil work, site facilities/buildings, a water system, and site electrical. These are indicated in Figure 18-2. Site civil work includes designs for the following infrastructure:

- Light vehicle and heavy equipment roads
- Stormwater diversion and detention ponds
- Growth media stripping and stockpiling
- Evapo-transpirative (ET) borrow cover
- Mine facility platform and the crusher platform
- Waste dump foundation
- The rhyolite borrow pit.

Figure 18-2: Site Layout Plan



Civil designs were completed to 10 to 40 percent. From the designs, material take-offs were completed and then fed into the capital cost estimate. To support the waste dump design, AMEC completed a stability analysis for the final dump configuration.

AMEC likewise completed designs to 10 to 40 percent for all site facilities. Site facilities include both mine facilities and process facilities. The mine facilities include the main office building, truck shop and warehouse, truck wash, fuel storage and distribution, and miscellaneous facilities. The process facilities include the process office building and assay laboratory and the product storage building. Both the mine facilities and the process facilities are serviced with potable water, fire water, power, propane, communication, and sanitary systems.

18.2.1 Water Requirements

AMEC designed the water system to meet both the average usage shown in Table 18-1 and the peak usage. Peak water requirements will occur during the summer when both water for mine dust suppression and construction are required. To address peak usage, a three million gallon make-up water pond is built. The make-up water pond's capacity is designed at five days of peak usage.

Potable water and fire water are stored in two separate tanks. The potable water tank is a 30-foot diameter by 25-foot high metal storage tank with a 120,000 gallon capacity. The fire water tank is a 48-foot diameter by 20-foot high metal storage tank with a 250,000 gallon capacity.

18.2.2 Power Requirements

Site power will be supplied by Mt. Wheeler Power. The Mt. Wheeler Power transmission line will be terminated at a new substation on site. The substation will have an incoming circuit breaker, disconnect switches, and protective equipment for the distribution of electrical power on site at 24.9 kilovolts.

The anticipated electrical load for the Gibellini mine site is as follows:

- Connected load 2.5 megawatts
- Average load 1.6 megawatts
- Power factor 95 percent.

Table 18-1: Average Water Usage

Use	Average Usage (gpm)
Potable Water	
Mine Facilities	10
Crusher	25
SX, Office, Laboratory	5
Sub Total Potable Water	40
Non Potable Water	
Process Makeup Water	300
Mine Usage	45
Construction	35
Sub Total Non Potable Water	380
Total	420

18.3 Off-Site Infrastructure

With the exception of road access, offsite infrastructure to support Gibellini operations is nonexistent. Because the Project relies on grid power and because a sustainable water source has not been identified on site, both offsite power and water will be constructed to site.

18.3.1 Electrical Line

The proposed 24.9 kilovolt distribution line route will be approximately 27.2 miles from the utility connection point to the Gibellini Project. The proposed utility connection point will be located 7.2 miles north of the intersection of US Highway 50 (US50) and Highway 892 (Strawberry Road) on the east side of Strawberry Road and will consist of a new seven megavolt-ampere, 69 kilovolt to 24.9 kilovolt substation. The new line will start at the substation and parallel an existing 24.9 kilovolt line (old cable size #4) for 17.2 miles. A total of 7.2 miles of the 17.2 miles will follow US Highway 892 south to the intersection of Highway 892 and US50 and will be 4/0 cable size. The line will continue on to the southwest for 10 more miles, but will be 1/0 cable. The existing 24.9 kilovolt line will be retired after completion of the new line. The final 10 miles of the line will be all new single-pole 1/0 design and will continue southwest for 10 miles following an existing paved road for as long as possible before heading to the west, ending at the Gibellini Project location.

18.3.2 Water Pipeline

Water will be supplied to the mine via a buried conveyance pipeline from the Don Hull ranch located approximately 14 miles northeast of the mine site (Figure 18-3). Water will be pumped from two existing wells (14-inch and 16-inch diameter well casing) at a rate of 250 gallons per minute each, utilizing a 50 horsepower vertical turbine pump placed in each well. The pumped water will be conveyed through a 12-inch HDPE DR9 pipeline from the ranch along the existing county road to an on-site booster pump (booster pipe #1) located near the east boundary of the proposed mine.

The operation of the well pumps will be controlled through a proposed fiber-optic line from the mine.

18.4 Fuel

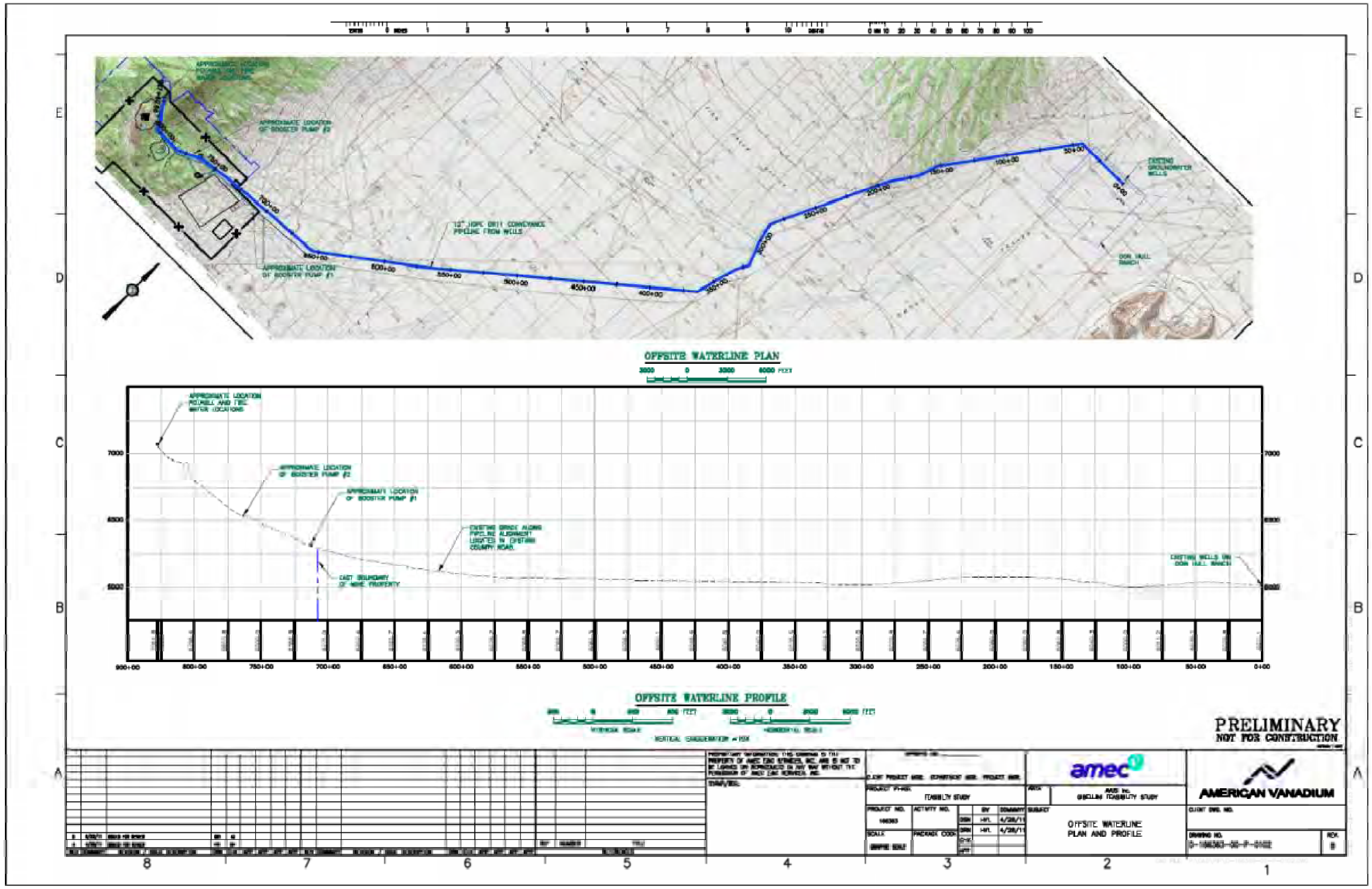
AMEC has estimated the average annual fuel consumption to be approximately 540,000 gallons per year.

18.5 Comment on Section 18

In the opinion of the QPs, the following conclusions are appropriate:

- Heap leach pad design is based on appropriate geotechnical testwork; stormwater considerations are dictated only by direct precipitation falling on the facilities
- Infrastructure to support the Gibellini project consists of site civil work, site facilities/buildings, a water system, and site electrical
- Infrastructure considerations are appropriate to the mining method and projected process route
- Supply of offsite power and water is required. A well field has been identified at the Don Hull ranch. Power will be supplied by a local utility.

Figure 18-3: Proposed Water Supply



19.0 MARKET STUDIES AND CONTRACTS

19.1 Market Studies

AMEC commissioned a market survey by the Roskill Consulting Group Ltd (Roskill) on behalf of American Vanadium to determine an appropriate vanadium price forecast for use in the Feasibility Study.

The survey reviewed:

- Vanadium consumption,
- World vanadium production,
- Vanadium market outlook, and
- Projected vanadium prices.

As a result of the market survey, AMEC utilized Roskill's Real (US$2010) V_2O_5 price forecast to support Project economics. The realized selling price over the life of the project was $10.95 per pound of V_2O_5 sold.

19.2 Contracts

American Vanadium has devised a marketing strategy. Under this strategy, American Vanadium proposes to ship a bagged product to a conversion company for conversion into a saleable product. AMEC has reviewed the strategy, and considers it appropriate to the product that American Vanadium will generate at Gibellini Hill.

19.3 Comments on Section 19

In the opinion of the QPs:

- AMEC reviewed the Roskill marketing study and has accepted the realized selling price over the life of the project indicated by Roskill.
- AMEC reviewed the proposed marketing strategy, and considers it appropriate to the product that American Vanadium will generate at Gibellini Hill.

AMEC recommends that American Vanadium assesses the following areas in relation to the marketing strategy:

- Complete a lease or purchase agreement for a rail head load out in Elko or Carlin for shipping the final product
- Negotiate firm pricing for product conversion, product shipping, and product marketing costs.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

American Vanadium will submit a Plan of Operations and Nevada Reclamation Permit Application (Plan) (Record Number NVN-088878) to the BLM and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) for the Project. This Plan will be is submitted in accordance with BLM Surface Management Regulations 43 Code of Federal Regulations (CFR) 3809, as amended, and Nevada reclamation regulations at Nevada Administrative Code (NAC) 519A. American Vanadium has contracted Enviroscientists, Inc. (Enviroscientists) to prepare the Plan document.

Following the submittal of the Plan of Operations to the BLM and the NDEP, regulations require that the BLM respond within 30 days to either issue a letter of completeness or require additional information. Following the issuance of the letter of completeness and review of available baseline data, the BLM will decide on the level of National Environmental Policy Act (NEPA) analysis required. If the BLM decides that an Environmental Assessment (EA) document is the appropriate level of analysis, American Vanadium will contract a third party contractor to prepare the EA. The EA process can ranges on average from nine months to 16 months depending on the complexity and nature of the proposed action and variability among the BLM offices. The project is located on lands within the jurisdiction of the Mount Lewis Field Office of the Battle Mountain District which regularly processes exploration and mining plans of operations and NEPA documents.

American Vanadium's proposed mining activities will create a total of approximately 440 acres of new mine related surface disturbance. The pipeline supplying process water to the mine will create additional surface disturbance. In addition, 50 acres of exploration activities within the Project Area will be proposed as part of this Plan. The Plan will also include alternative alignments for a new 24.9 kilovolt distribution line. The construction, operations, and maintenance of the power line will be documented in a separate Plan of Development and right-of-way (ROW) application submitted by Mt. Wheeler Power.

20.1 Baseline Studies

Baseline studies have commenced, and include studies to document the existing conditions of biological resources, cultural resources, surface water resources, ground water resources, and waste rock geochemical characterization. The baseline data collected is subject to review and approval by the BLM and the NDEP and other cooperating agencies and is considered preliminary at this stage in the permitting and planning process.

20.2 Environmental Issues

No key environmental issues have been identified at this stage in the permitting and planning process. The agency scoping and preparation of the NEPA document will include the identification of issues that will guide the analysis to appropriately address any concerns or questions that may arise in relationship to the implementation of the proposed action.

20.3 Closure Plan

American Vanadium is currently conducting the necessary environmental, geotechnical, and laboratory testing to support a closure plan for the Project. Standard reclamation measures will be described in the Plan of Operations/Nevada Reclamation Permit Application developed for the project. A Closure Plan will be developed and updated throughout the life of the Project. A final Closure Plan will need to be submitted and approved approximately two years prior to the commencement of closure and final reclamation activities of the Project.

The Nevada Standardized Reclamation Cost Estimator (SRCE) was used to estimate reclamation cost for the project to support the Feasibility Study. Enviroscientists' preliminary estimate for reclamation and closure costs is $14.6 million.

20.4 Permitting

Prior to commencing any mining operations on public lands administered by the BLM, a Plan of Operations (Plan) describing how American Vanadium will prevent unnecessary and undue degradation of the land and reclaim the disturbed areas must be submitted to the BLM. The Plan must contain the following:

- Operator Information – general information about American Vanadium including mailing address, phone number, corporate point of contact, taxpayer identification number, and BLM serial numbers of unpatented mining claims where disturbance will occur,
- Description of Operations – A general description of the mining operations proposed at the Gibellini Project including:
  - Maps showing mining activities, processing facilities, waste rock disposal areas, support facilities, structures, buildings, and access routes,

  - Preliminary or conceptual designs, cross sections, and operating plans for mining areas, process facilities, and waste rock disposal areas,
  - Water management plans, rock characterization and handling plans, quality assurance plans,
  - Spill contingency plan,
  - A general schedule of operations from start through closure, and
  - Plans for all access roads, water supply pipelines, and power or utility services.

- Reclamation Plan – A plan for reclamation to meet the standards in CFR 3809.420, including regrading and reshaping; mine reclamation, wildlife habitat rehabilitation; topsoil handling, revegetation, isolation and control of acid-forming, toxic, or deleterious materials, removal or stabilization of buildings, structures, and support facilities, and post-closure management,
- Monitoring Plan – A proposed plan for monitoring the effect of operations that includes methods to:
  - Demonstrate compliance with the approved plan of operations and other federal and state environmental laws and regulations,
  - Provide early detection of potential problems,
  - Supply information that will assist in directing corrective actions should they become necessary, and
  - Monitoring plans include details on type and location of monitoring devices, sampling parameters and frequency, analytical methods, reporting procedures, and procedures to respond to adverse monitoring results. Examples of monitoring programs which may be necessary include surface and ground water quality and quantity, air quality, revegetation, stability, noise levels, and wildlife mortality, and
- Interim Management Plan – A plan to manage the project area during periods of temporary closure to prevent unnecessary and undue degradation. The interim management plan must include measures to stabilize excavations and workings, measures to isolate or control toxic or deleterious materials, provisions for the storage or removal of equipment, supplies and structures, measures to maintain the project area in a safe and clean conditions, plans for monitoring site conditions during periods of non-operation, and a schedule of anticipated periods of temporary closure during which American Vanadium would implement the interim management plan, including provisions for notifying the BLM of unplanned or

extended temporary closures. In addition, the cost for a third party contractor to perform reclamation activities on the mine must be submitted with the Plan.

The Nevada Bureau of Mining Regulation and Reclamation (BMRR) will need to issue a Mining Reclamation Permit and a Water Pollution Control Permit (WPCP). The Plan of Operation document described above fulfills the requirements of the application for the Mining Reclamation Permit. Application review takes the BMRR approximately 180 days from submittal and will include a public notice. The BLM and the BMRR will jointly agree on the reclamation bond amount.

In addition to the approvals discussed in this section, American Vanadium must notify the Northern Nevada Mine Safety and Health Administration (MSHA) prior to the commencement of mining operations. Notification can be completed with the mine registry form that will be submitted to NDOM. In addition to the notification of operations, the facility must also submit a training plan to MSHA for approval 30 days prior to operations and obtain a Mine Identification number.

20.5 Considerations of Social and Community Impacts

American Vanadium will take all the necessary steps to engage the local community to create awareness regarding the project. During the NEPA process, the public will have multiple opportunities to engage and comment on the project and express support or concerns. The BLM will coordinate with local Native American tribes and interested parties throughout the permitting and NEPA process. The NEPA document will analyze how the project will affect the social and economic values of the community. Additional coordination between American Vanadium and local governments will occur throughout the planning and permitting phase, operating phase, and closure phase of the Project to ensure that the project addresses social and cultural considerations.

Similar to other management structures implemented at the mine, the Environmental Management System (EMS) will be developed to ensure that environmental issues are administered accurately and efficiently. American Vanadium's work practices, training programs, operating procedures, reporting requirements, and safety and health program will be in compliance with the Mines Act.

20.6 Comments on Section 20

In the opinion of the QPs, the following conclusions are appropriate:

- American Vanadium will submit a Plan of Operations and Nevada Reclamation Permit Application (Plan) (Record Number NVN-088878) to the BLM and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) for the Project
- American Vanadium's proposed mining activities will create a total of approximately 440 acres of new mine surface disturbance. The proposed water pipeline and transmission line will also create surface disturbance
- Based on early scoping with the BLM, the size and nature of the Project, an Environmental Assessment (EA) document was considered the likely route pending the results of the baseline data collection and review by permitting agencies and additional BLM project scoping
- Preliminary baseline studies have commenced
- No key environmental issues have been identified at this stage in the permitting and planning process

21.0 CAPITAL AND OPERATING COSTS

21.1 Capital Cost Estimates

21.1.1 Basis of Estimate

The capital cost estimate was based on the following project data:

- Design criteria
- Flow sheets – process flow diagrams and piping and instrumentation diagrams (PFDs and P&Ids)
- Preliminary general arrangement drawings
- Single-line electrical drawings
- Supplemental sketches as required
- Budgetary quotations for mechanical equipment (process equipment, pumps, tanks, valves, piping, electrical equipment, fixed and mobile equipment)
- Local quotes were obtained for common bulk material items
- In-house historical data
- Local contractor / vendor pricing.

21.1.2 Labor Assumptions

Labor rates were established based on local Nevada rates obtained from a contractor doing work in the area.

21.1.3 Material Costs

Earthwork quantities were calculated based on site layouts to achieve the required cuts/fills for the Project. Concrete quantities were estimated from general arrangements and sketches. Steel quantities were based on material take-offs derived from preliminary drawings and sketches.

Process equipment pricing was based on new equipment and was priced with vendor budget quotations. Supply and installation of bulk material costs were based on area supplier rates and in-house historical data. Used equipment was not considered in this estimate; however, it might be considered as a value-engineering item.

The electrical estimate was based on preliminary single-line diagrams and the connected loads detailed on the equipment list. Vendor quotations were used for the major electrical items, combined with AMEC in-house data.

The instrumentation estimate was based on the engineers understanding of the process requirements and uses a PLC based Distributed Control System.

Construction equipment was included in the line items as rental equipment, such as forklifts, manlifts, compressors, welding machines, light plants, scaffolding, and heavy lifting equipment.

First fills were included and budgeted using current commodity prices.

Engineering, procurement and construction management (EPCM) work was estimated by AMEC. Vendor representatives were included in the indirects as a separate cost based on estimated costs provided by vendors for major equipment packages, and an allowance for the remaining equipment. Freight costs were included as a percentage of the Material cost

Sales tax was included at the current tax rate for Eureka County, which is 6.85 percent.

Owner's costs were not included in the estimate.

A line item for miscellaneous spares was not included in the capital cost estimate. Instead, spare parts were accounted for in either the equipment pricing, design redundancy, or operating estimates.

21.1.4 Contingency

The contingency amount was an allowance added to the Capital Cost Estimate to cover unforeseeable costs within the scope of the estimate. Contingency allocations were as indicated in Table 21-1.

21.1.5 Capital Cost Summary

The capital cost estimate for the Gibellini Vanadium Mine Feasibility Study Project was prepared as an AMEC Type 3 estimate, having 10 percent to 30 percent of full project definition. The Owner's costs are not included in this estimate. The estimate for AMEC's scope is considered to be at a feasibility level with an expected accuracy range of -10 percent to +15 percent, and includes contingency.

Table 21-1: Contingency Percentage

Area	Allocation
Construction Labor	-15% +25%
Materials – Process Equipment / Bulks	-5% +15%
Subcontracts	-10% +5%
Construction Equipment	-15% +25%
Indirect Costs	-5% +15%
Composite Total	12.60%

The total estimated cost to construct, install and commission the facilities described in this Report is US $95.5 million. The estimate incorporates all direct field costs required to execute the project and the indirect costs associated with its design, construction, and commissioning. A summary overview of the estimate is shown in Table 21-2. The base pricing is second quarter 2011 United States dollars. Further escalation is excluded from this study.

The cost presented herein includes all known engineering, design, materials, labor, construction equipment, and engineered equipment required to accomplish a complete mining project.

It is important to note that economic conditions at this time are fluctuating, and the costs presented here are not necessarily the lowest nor the highest quoted, but use the best judgment of the estimator.

Due to the short mine life and contract mining, very little sustaining capital is required for the Gibellini Project. The most significant sustaining capital item is the 10 million ton, Phase II leach pad expansion in Year 3 (Table 21-3).

Miscellaneous sustaining capital is required in Year 4 and Year 5 for general equipment purchases, predominately light vehicles that are used to commute to the project site on a daily basis. Table 21-4 provides a summary of the sustaining capital by year.

21.2 Operating Cost Estimates

21.2.1 Basis of Estimate

Gibellini salary and hourly wage rates were based on a 2010 labor survey for Northern Nevada.

Table 21-2: Summary of Capital Costs

Cost Description	Total ($000s)
OPEN PIT MINE	
Open Pit Mine Development	1,285
Mobile Equipment	101
INFRASTRUCTURE-ON SITE	
Site Prep	2,213
Roads	1,266
Water Supply	1,827
Sanitary System	55
Electrical - On Site	1,867
Communications	150
Contact Water Ponds	158
Non-Process Facilities — Buildings	6,901
PROCESS FACILITIES	
Ore Handling	13,996
Heap Leach System	18,235
Process Plant	13,142
OFF-SITE INFRASTRUCTURE	
Water System	4,091
Electrical Supply System	2,936
First Fills	783
Total Direct Cost	69,007
Construction Indirect Costs	3,860
Sales Tax / OH&P	3,844
EPCM	8,058
Contingency	10,681
Total Project Cost	95,451

Table 21-3: Phase II Leach Pad Expansion Capital

Phase II Leach Pad Expansion	Total ($000s)
Total Direct Cost	6,733
Construction Indirect Costs	inc
Sales Tax / OH&P	inc
EPCM	inc
Contingency	808
Total Project Cost	7,541

Table 21-4: Sustaining Capital

Sustaining Capital (000's)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y1 - Y7
Phase II Leach Pad Expansion			7,541					7,541
Light Vehicles				77	116			193
Total	**-**	**-**	**7,541**	**77**	**116**	**-**	**-**	**7,734**

Gibellini will utilize three schedules. Process operations, including crushing, stacking, and leaching, are scheduled to operate 24 hours per day, seven days per week and 365 days a year. Process operations are supported by four crews rotating on two 12 hour shifts. Mine operations are scheduled for weekday operations only. One crew is scheduled 10 hours per day, five days per week, 365 days a year, Monday through Friday of each week.

Support staff not directly tied to operations work a 10-hour day, four days per week, 365 days a year schedule. Generally support staff work Monday through Thursday.

Consumables are categorized into general consumables and process consumables. AMEC solicited pricing for general consumables (electrical power, diesel fuel, and natural gas) from the primary local providers. For process consumables, AMEC solicited multiple vendors with the aim of receiving three supporting price quotes.

21.2.2 Mine Operating Costs

The basis for mining the Gibellini deposit is contract mining.

Mine operating costs are inclusive of all costs to drill, blast, load, and haul both ore and waste to the waste dump and the ore stockpile respectively. Mine costs are also inclusive of support equipment utilized to maintain the mine roads, pit working area, waste dump, and ore stockpile area.

Total mining costs, inclusive of both contract and owner's costs, is $2.42 per ton mined ($2.94 per ton leached).

21.2.3 Process Operating Costs

Process operating costs included all costs to rehandle ore from stockpile, crush, agglomerate, stack, leach, process, and bag the final product. Process costs were also inclusive of a $0.28 per ton incremental ore haul cost. Product transportation costs from the mine site to point of conversion and conversion costs are accounted for separately outside of the processing cost area.

Total process operating costs average $12.51 per ton leached:

Reagent costs account for the largest share of the overall processing costs contributing over 71 percent to the total processing cost. By far, sulfuric acid accounts for the largest share of consumable costs at $6.91 per ton leached. Powdered iron is the next highest contributor to consumable unit pricing at $1.11 per ton leached.

The process variable costs account for process maintenance, laboratory operations, and miscellaneous processing costs. They were estimated as a percentage of total process consumable costs. Average annual process variable costs are $3.3 million or $1.11 per ton leached.

A re-handle cost of $0.60 per ton re-handled was incorporated. In addition, $0.28 per ton was applied to each ore ton delivered to the coarse ore stockpile to account for the 4,000-foot incremental ore haul between the waste dump and the coarse ore stockpile.

Process labor costs account for $1.32 per ton leached.

Process mobile equipment accounts for $0.28 per ton leached.

21.2.4 General and Administrative Operating Costs

General and Administrative (G&A) costs average approximately $2.4 million per year and average $0.86 per ton leached. The G&A costs include staff labor costs, G&A operating costs, Eureka office operating costs, and G&A equipment costs.

21.2.5 Operating Cost Summary

Annual operating costs average approximately $48 million per year (see Figure 21-1) with the exception of Year 1 and Year 7, the start-up and decommission years respectively. Annual cost fluctuations during Year 2 through Year 6 are primarily the result of changes in the waste mining quantities.

On a per-ton basis, the operating costs average $16.31 per ton leached. Table 21-4 provides a breakdown of the operating costs by cost area.

Processing accounts for the the majority of the operating costs at approximatley 77 percent of the total costs. Figure 21-5 provides a percentage of total contribution for the operating cost areas. The main driver in processing costs is the sulfuric acid cost that averages $6.91per ton leached, accounting for 42 percent of the total operating costs.

Mining costs at $2.94 per ton leached and 18 percent of the total operating cost (refer to Figure 21-5) are low when compared to other mining projects due to an extremely low overall waste to ore strip ratio of 0.22.

Figure 21-1: Annual Operating Costs

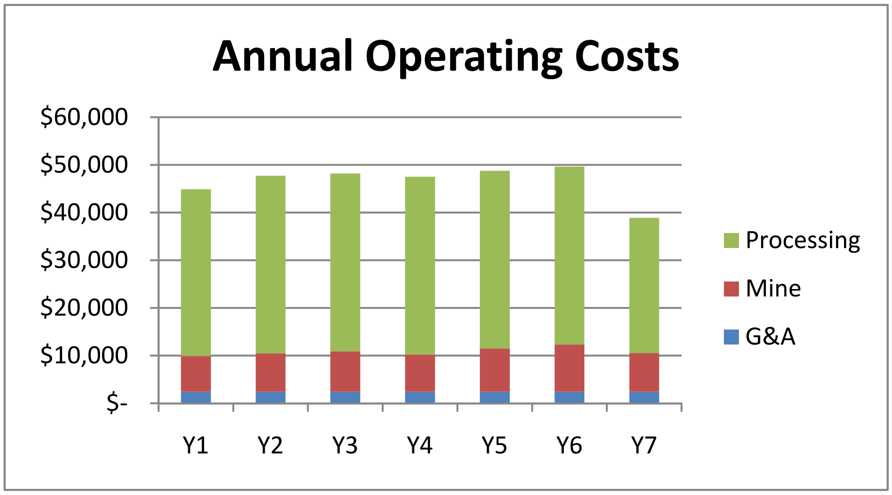
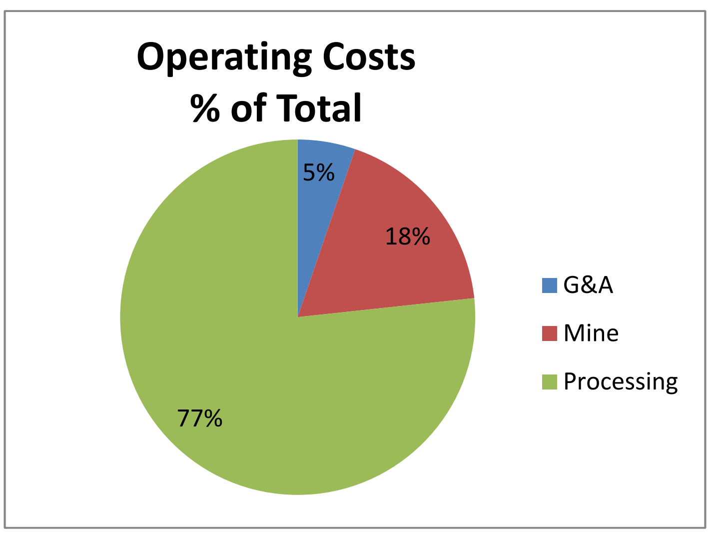


Table 21-5: Operating Cost per Ton Leached

Operating Costs	USD/t
G&A	$ 0.86
Mine	$ 2.94
Processing	$ 12.51
Total Cash Operating Costs	$ 16.31

Figure 21-2: Operating Costs, Percentage of Total



Labor costs, when accounted for sepearately, for the 70 Gibellini employees is approximatley $2 per ton leached. In addition to the 70 Gibellini employees, 21 contract mine personnel are required. Table 21-5 provides a breakdown of total manpower by area.

21.3 Comments on Section 21

In the opinion of the QPs:

- Capital costs have been appropriately estimated and are based on a combination of quotes, vendor pricing, and experiences with similar-sized operations.
- The estimate for AMEC's scope is considered to be at a feasibility level with an expected accuracy range of -10 percent to +15 percent, and includes a contingency.
- The total estimated cost to construct, install and commission the facilities described in this Report is US $95.5 million. It is important to note that economic conditions at this time are fluctuating, and the costs presented here are not necessarily the lowest nor the highest quoted, but use the best judgment of the estimator.
- Operating costs have also been appropriately estimated and are based on a combination of quotes, vendor pricing, and experiences with similar-sized operations.

- Annual operating costs average approximately $48 million per year with the exception of Year 1 and Year 7, the start-up and decommission years respectively. Annual cost fluctuations during Year 2 through Year 6 are primarily the result of changes in the waste mining quantities.

Table 21-6: Manpower by Area

Site Personnel	2013Q1	2013Q2	2013Q3	2013Q4	2014	2015	2016	2017	2018	2019
G&A Personnel	14	14	14	14	14	14	14	14	14	14
Mining Personnel	6	6	6	6	6	6	6	6	6	6
Process Personnel	50	50	50	50	50	50	50	50	50	50
Total Owner's Personnel	70	70	70	70	70	70	70	70	70	70
Contract Mine Personnel	21	21	21	21	21	21	21	21	21	21
Total Site Personnel	91	91	91	91	91	91	91	91	91	91

22.0 ECONOMIC ANALYSIS

The results of the economic analysis represent forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Forward-looking information includes Mineral Reserve estimates; commodity prices; the proposed mine production plan; projected recovery rates; use of a process method, that although well-known and proven on other deposit types, has not been previously brought into production for a vanadium project; infrastructure construction costs and schedule; and assumptions that Project environmental approval and permitting will be forthcoming from County, State and Federal authorities.

22.1 Valuation Methodology

Financial analysis of the Gibellini project was carried out using a discounted cash flow (DCF) approach. This method of valuation requires projecting yearly cash inflows, or revenues, and subtracting yearly cash outflows such as operating costs, capital costs, royalties, and taxes. The resulting net annual cash flows are discounted back to the date of valuation and totalled to determine the net present value (NPV) of the project at selected discount rates.

The internal rate of return (IRR) is expressed as the discount rate that yields an NPV of zero.

The payback period is the time calculated from the start of production on 1/1/2013 until all initial capital expenditures have been recovered.

This economic analysis includes sensitivities to variation in operating costs, capital costs, and metal price.

All monetary amounts are presented in United States dollars (US$).

It should be noted that, for the sake of discounting, cash flows are assumed to occur at the end of each period. All cash flows are discounted to the beginning of Q1 2012.

22.2 Financial Model Parameters

This financial evaluation was prepared by AMEC and is based on:

- V_2O_5 pricing forecast provided by Roskill
- Onsite capital and sustaining capital cost estimates prepared by AMEC

- Offsite power line capital costs prepared by Hanlon
- Owner's capital costs excluded at the request of American Vanadium
- Closure and permitting costs prepared by Enviroscientists
- Resource estimate, mine schedule, and mine plans prepared by AMEC
- Contract mining costs based on independent contract quotes solicited by AMEC
- Owner's mining, processing, and G&A operating costs estimated by AMEC.

22.2.1 Mineral Resource, Mineral Reserve, and Mine Life

The Project mine plan is based on Proven and Probable Mineral Reserves totalling 19,969 kt grading 0.302% V_2O_5, for 120,515 thousand pounds of contained V_2O_5.

22.2.2 Metallurgical Recoveries

Gibellini is scheduled to leach at a three million ton per year rate with average recoveries for oxide ores and transition ores estimated at 60 percent and 70 percent respectively. A summary of recovered metals is shown in Table 22-1.

22.2.3 Metal Prices

Metal prices used for the economic analysis are based Roskill's pricing forecast for V_2O_5 (pentoxide). Roskill also forecasted ferrovanadium prices; however, because pricing to convert V_2O_5 to ferrovanadium is unknown at this time, the basis of the economic analysis is producing and selling a V_2O_5 product.

The average realized V_2O_5 selling price is $10.95 per pound based on the Roskill price forecast

22.2.4 Transport and Selling Costs

Selling costs are estimated at five percent of the product price within the financial analysis. The selling cost covers the brokerage fee to market and sell the V_2O_5 product. Over the Project life, selling costs are estimated at $43.5 million.

Table 22-1: Annual Recovered Pounds V_2O_5

Year	V_2O_5 Pounds Produced (x 1,000)
Year 1	9,022
Year 2	14,467
Year 3	11,890
Year 4	11,297
Year 5	13,620
Year 6	10,578
Year 7	8,599
Total	*79,473*

22.2.5 Royalties

American Vanadium will pay a production royalty of 2.5 percent of the NSR until royalty payments reach a total of $3 million, where the royalty decreases to 2.0 percent. Estimated royalty payments per year of operation are shown in Table 22-2.

22.2.6 Operating Costs

Operating costs are summarized in Table 22-3, which lists the average expenditure per ton leached.

22.2.7 Capital Costs

The estimated project capital costs are distributed as follows:

- Pre-production capital: $95.4 million
- Sustaining capital: $7.7 million
- Total project Capex: $103.1 million.

22.2.8 Taxes

AMEC does not provide expert advice on taxation matters. The tax calculations included in this analysis are based on a simple tax model. The parameters used to define the taxation structure were sourced from various reference guides including InfoMine's 2010 tax guide document.

Table 22-2: Annual Royalty Payments

Year	Royalty Payment (000's)
2013	$ 1,822
2014	$ 2,687
2015	$ 2,303
2016	$ 2,315
2017	$ 3,037
2018	$ 2,541
2019	$ 2,209
Total	$ 16,914

Table 22-3: Summary of Operating Costs

Operating Costs	USD/t
G&A	$ 0.86
Mine	$ 2.94
Processing	$ 12.51
Total Cash Operating Costs	$ 16.31

Generally, the following inputs were used to guide the tax calculations:

- Modified accelerated cost recovery (MACR) is used to estimate depreciation. Asset class lives follow: thirty-nine years for surface facilities, seven years for plant and equipment, seven years for mobile equipment, and seven years for furniture and office equipment
- 22 percent percentage depletion
- 59(e) recapture of $3.95 million in exploration expenditures
- Five percent Nevada Net Proceeds tax
- A top federal tax rate of 35 percent.

In addition to calculating regular federal tax, an alternate minimum tax (AMT) calculation was made. In all but two years, Year 5 and Year 7, AMT is triggered. The Project ends with an AMT credit of $3.3 million.

Over the course of the Project, approximately $10.2 million in Nevada net proceeds taxes is paid and $71.3 million in Federal taxes are paid.

The property tax rate in Eureka county Nevada is 1.94 per cent. This rate is applied to 35 percent of the taxable project value. Over the Project life, Gibellini pays approximately $2.1 million in property tax.

22.2.9 Holding Fees

American Vanadium signed a mineral lease agreement on 13 March 2006 for a 100 percent interest in 41 claims (Black Hill, Black Iron, Flat, Manganese, Rattler, Rift, and Clyde series), covering portions of Sections 26, 34, 35, and 36 T16N, R52E and portions of Sections 1, 2 and 3 T15N, R52E MDBM, known as the Gibellini property, from the registered owners Janelle Dietrich, Kenneth Campbell, and Jacqualeene Campbell. As advance royalties, RMP paid $60,000 upon execution of the agreement and will pay $30,000 for each calendar quarter thereafter until American Vanadium begins payment of production royalties or terminates the lease agreement. Advance royalties are deductible cumulatively as a credit against production royalties; consequently, advance royalties result in a $600,000 credit within the financial analysis due to the payment of production royalties starting in Q1 2012.

22.2.10 Closure Costs

Reclamation and closure costs have been estimated by Enviroscientists and are incorporated within the financial model as an accrual against V_2O_5 production. Closure costs are estimated at $14.6 million.

22.2.11 Salvage Value

No salvage values were estimated. After seven years of use, the process mobile equipment will have little value and the fixed equipment will likely have little value outside of the Gibellini Project.

22.2.12 Inflation

The financial analysis assumes constant 2011 dollars because the underlying assumption is that inflation is offsetting for revenue and costs.

22.3 Financial Results

Based on AMEC's financial evaluation, the Gibellini Project generates positive financial results. The pre-tax NPV at a seven percent discount rate (the base case rate) is $226.3 million and the IRR is 51 percent (Table 22-4). The after tax NPV at a seven percent discount rate is $170.1 million and the IRR is 43 percent (Table 22-5). Payback for the Project is estimated at 2.06 years and 2.38 years for the pre-tax and after tax scenarios respectively.

Cashflow on an annualised basis are shown in Table 22-6.

Table 22-4: Summary Cash Flow Results, Pre-Tax (base case is highlighted)

Cash Flow Pre-Tax (000's)	$357,226
NPV @ 5%	$257,499
NPV @ 7%	$226,309
NPV @ 10%	$186,649
IRR Pre-Tax	51%
Payback - Years from Startup	2.06

Table 22-5: Summary of Cash Flow Results, After Tax (base case is highlighted)

Cash Flow After Tax (000's)	$275,719
NPV @ 5%	$195,216
NPV @ 7%	$170,071
NPV @ 10%	$138,131
IRR After Tax	43%
Payback - Years from Startup	2.38

Table 22-6: Project Annualized Cash Flow Table

CASH FLOW			Total	PPQ1	PPQ2	PPQ3	PPQ4	Y1Q1	Y1Q2	Y1Q3	Y1Q4	Y2Q1	Y2Q2	Y2Q3	Y2Q4	Y3	Y4	Y5	Y6	Y7
				1/1/2012	4/1/2012	7/1/2012	10/1/2012	1/1/2013	4/1/2013	7/1/2013	10/1/2013	1/1/2014	4/1/2014	7/1/2014	10/1/2014	1/1/2015	1/1/2016	1/1/2017	1/1/2018	1/1/2019
Days per Period			5,210	91	91	92	92	90	91	92	92	90	91	92	92	365	366	365	365	365
Production																				
Total Waste & LG Stkp	tons		4,300,491	-	-	-	-	151,896	40,344	59,583	84,674	82,401	32,346	69,093	133,131	500,698	189,646	760,414	1,155,219	1,199,853
Total Leach	tons		18,958,743	-	-	-	-	587,500	750,000	750,000	750,000	750,000	750,000	750,000	750,000	3,300,000	3,000,000	3,000,000	3,000,000	2,131,343
Leach Grade	%V2O5		0.30%	0.00%	0.00%	0.00%	0.00%	0.23%	0.26%	0.27%	0.31%	0.30%	0.30%	0.38%	0.30%	0.31%	0.20%	0.33%	0.26%	0.20%
Leach Product	lbs		120,514,794	-	-	-	-	2,684,130	3,798,591	4,046,254	4,598,372	5,896,887	5,878,822	5,860,148	4,473,550	18,309,836	17,374,278	20,062,144	15,542,222	12,201,791
Total Material Mined	tons		34,250,234	-	-	-	-	859,396	790,344	809,583	814,674	812,401	782,346	809,093	883,131	3,500,698	3,189,646	3,760,414	4,155,219	3,331,196
Total Leach to Heap	tons		18,958,743	-	-	-	-	546,333	750,116	750,638	750,000	746,613	750,546	750,636	750,000	2,666,596	3,000,136	2,666,866	3,000,000	2,180,558
Leach Grade	%V2O5		0.30%	0.00%	0.00%	0.00%	0.00%	0.23%	0.25%	0.27%	0.30%	0.39%	0.39%	0.39%	0.30%	0.31%	0.29%	0.33%	0.26%	0.29%
V2O5 Lbs Contained	lbs		120,514,794	-	-	-	-	2,505,130	3,727,074	4,032,825	4,551,147	5,802,872	5,884,333	5,878,622	4,550,937	18,300,409	17,390,434	20,017,180	15,616,522	12,457,279
Average Recovery	%		65.8%	0.0%	0.0%	0.0%	0.0%	60.5%	60.0%	60.6%	62.5%	66.8%	66.7%	67.9%	61.5%	65.0%	65.0%	68.1%	67.7%	69.1%
V2O5 Lbs Recoverable	lbs		78,812,727	-	-	-	-	1,503,078	2,236,217	2,442,820	2,836,285	3,853,317	3,927,846	3,852,249	2,829,750	11,890,284	11,295,844	13,626,702	10,575,269	8,598,828
Metal Produced	lbs		[illegible]	-	-	-	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Metal Payable	lbs		75,499,091	-	-	-	-	1,427,941	2,124,502	2,328,777	2,697,395	3,575,341	3,731,450	3,559,637	2,682,032	11,295,894	-	-	-	-
Operating Cost/Ton Leached	$/ton	$	16.3	-	-	-	-	17.0	15.9	15.9	15.6	15.9	15.6	15.9	16.1	16.1	15.8	16.3	16.5	17.8
Operating Cost/lb Produced	$/lb		4.10	-	-	-	-	6.19	5.25	4.88	4.20	3.07	3.02	3.10	4.26	4.05	4.21	3.58	4.69	4.52
Cash Flow (000's)																				
V2O5 Price	$/lb		10.96	7.68	7.08	7.08	7.48	8.31	8.01	8.01	8.01	9.27	9.27	9.27	9.27	10.30	10.89	11.84	12.75	13.63
Revenue - $ 000's																				
V2O5 Revenue			827,001	-	-	-	-	12,295	10,282	19,902	20,225	34,024	34,591	30,925	24,062	116,346	116,073	153,199	126,130	111,309
Transportation Charge			5,003	-	-	-	-	151	225	246	286	389	396	388	284	1,197	1,138	1,372	1,065	866
Royalty Payment			15,814	-	-	-	-	304	452	493	872	841	864	871	482	2,303	2,315	3,037	2,541	2,229
Total Net Revenue			802,184	-	-	-	-	11,840	17,618	19,242	22,388	32,794	33,611	32,666	24,087	112,846	113,421	148,791	124,523	108,264
Cash Operating Costs - $ 000's																				
G&A		0.86	17,078	-	-	-	-	601	608	615	615	601	608	615	615	2,439	2,446	2,439	2,439	2,439
Mine		2.01	59,762	-	-	-	-	1,606	1,931	1,876	1,988	1,877	1,913	1,874	2,136	8,468	7,779	9,037	9,901	8,087
Processing		12.51	249,811	-	-	-	-	7,136	9,209	9,339	9,330	9,396	9,326	9,338	9,330	37,289	37,307	37,291	37,292	28,362
Total Cash Operating Costs		15.31	325,651	-	-	-	-	9,337	11,747	11,828	11,934	11,874	11,847	11,827	12,084	48,195	47,522	48,766	49,632	38,887
Total Cash Costs - $ 000's																				
Total Cash Operating Costs			325,651	-	-	-	-	9,337	11,747	11,828	11,934	11,874	11,847	11,827	12,084	48,195	47,522	48,766	49,632	38,887
Property Tax			2,114					156	161	147	142	130	122	114	106	364	267	203	142	93
Holding Fees			(600)	-	-	-	-	30	30	30	30	30	(750)	-	-	-	-	-	-	-
Total Cash Costs			327,164	-	-	-	-	9,491	11,938	12,005	12,106	12,035	11,219	12,041	12,190	48,549	47,789	48,969	49,774	38,979
Total Production Costs - $ 000's																				
Total Cash Costs			327,164	-	-	-	-	9,491	11,938	12,005	12,106	12,035	11,219	12,041	12,190	48,549	47,789	48,969	49,774	38,979
Reclamation & Closure Accrual			11,896	-	-	-	-	276	411	418	821	700	721	707	618	2,193	2,074	2,899	1,642	1,679
59(e) Deduction			2,785	-	-	-	-	97	98	100	100	97	98	100	100	395	395	395	395	395
Depreciation			91,004	-	-	-	-	3,156	3,156	3,156	3,156	5,415	5,415	5,415	5,415	16,605	13,004	9,380	9,001	8,729
Depletion Allowance			162,178	-	-	-	-	-	1,011	1,718	3,241	7,295	7,372	7,231	2,933	22,557	24,963	32,734	27,395	23,818
Total Production Costs			597,698	-	-	-	-	13,020	16,604	17,526	19,124	26,470	24,827	25,494	21,154	90,289	88,214	93,879	86,508	73,491
Income from Operations - $ 000's																				
Net Revenue			802,164	-	-	-	-	11,840	17,615	19,243	22,366	32,794	33,511	32,666	24,087	112,846	113,421	148,791	124,523	108,264
Production Costs			597,698	-	-	-	-	13,020	16,604	17,526	19,124	26,470	24,827	25,494	21,154	90,289	88,214	93,879	86,508	73,491
Net Income Before Taxes - $ 000's			204,466					(1,180)	1,011	1,716	3,241	7,324	8,688	7,173	3,033	22,557	26,207	54,913	38,016	34,773
Income from Operations - $ 000's																				
Nevada Net Proceeds Tax		5.0%	13,223	-	-	-	-	(39)	51	86	162	366	434	359	147	1,128	1,280	2,741	1,801	1,739
Federal Corporate Tax			71,284	-	-	-	-	(234)	594	659	1,254	2,605	3,125	2,647	1,144	8,797	9,780	18,951	12,522	11,371
+ 59(e) Deduction			2,785	-	-	-	-	97	98	100	100	97	98	100	100	395	395	395	395	395
+ Depreciation			91,004	-	-	-	-	3,156	3,156	3,156	3,156	5,415	5,415	5,415	5,415	16,605	13,004	9,380	9,001	8,729
+ Depletion Allowance			162,178	-	-	-	-	-	1,011	1,718	3,241	7,295	7,372	7,231	2,933	22,557	24,963	32,734	27,395	23,818
Net Income After Taxes - $ 000's			379,004					2,398	4,632	5,633	8,812	18,861	18,072	18,030	10,006	52,169	62,518	77,810	61,694	54,608
Capital Cost - $ 000's																				
Initial			95,451	-	-	41,052	54,398	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining			7,734	-	-	-	-	-	-	-	-	-	-	-	-	7,541	77	116	-	-
Total Capital			103,185	-	-	41,052	54,398	-	-	-	-	-	-	-	-	7,541	77	116	-	-
Salvage Value																				
Working Capital - $ 000's																				
Working Capital			-	-	-	-	-	4,003	-	-	-	-	-	-	-	-	-	-	-	(4,003)
Cash Flow Before Tax			357,226	-	-	(41,052)	(54,398)	(2,581)	5,277	6,666	9,738	20,952	21,571	20,119	11,380	54,572	68,481	97,305	72,807	72,309
Cumulative Before Tax Cash Flow				-	-	(41,052)	(95,451)	(98,032)	(92,755)	(86,087)	(76,329)	(55,377)	(34,706)	(14,588)	(3,208)	51,364	119,845	212,050	284,857	357,226
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15			

Annualized Cash Flow Before Tax		$	357,226	(95,461)	19,122	73,121	54,572	63,481	97,205	72,807	72,369	-	-	-	-	-	-	-		
Cumulative Before Tax Cash Flow			$	(95,461)	(76,328)	(3,208)	51,364	114,845	212,050	284,857	357,226	357,226	357,226	357,226	357,226	357,226	357,226	357,226		
NPV @	5%	$	257,499																	
NPV @	7%	$	226,309																	
NPV @	10%	$	186,649																	
IRR			51.0%																	
Payback - Years from Startup			2.06																	
Cash Flow After Tax		$	275,719	-	-	(41,052)	(54,398)	(2,297)	4,832	5,933	8,312	18,851	18,012	16,900	10,090	44,647	62,441	77,504	58,684	59,260
Cumulative After Tax Cash Flow				0	-	(41,052)	(95,461)	(97,748)	(92,916)	(86,983)	(78,672)	(61,820)	(43,808)	(26,906)	(16,816)	27,831	80,271	157,775	216,459	275,719
				Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15		
Annualized Cash Flow After Tax		$	275,719	(95,461)	18,779	61,865	44,647	62,441	77,504	58,684	59,260	-	-	-	-	-	-	-		
Cumulative Before Tax Cash Flow			$	(95,461)	(76,672)	(16,816)	27,831	80,271	157,775	216,459	275,719	275,719	275,719	275,719	275,719	275,719	275,719	275,719		
NPV @	5%	$	195,216																	
NPV @	7%	$	170,071																	
NPV @	10%	$	138,131																	
IRR			42.5%																	
Payback - Years from Startup			2.38																	

22.4 Sensitivity Analysis

A sensitivity analysis was completed over the ranges of ±30 percent for metal price (V_2O_5), operating costs, and capital costs. Note that sensitivity to grade and recovery are coincidental to metal price and follow the same trend.

Based on the sensitivity work, the Gibellini Project is most sensitive to metal price followed by operating costs.

The Project is least sensitive to capital costs.

Spider graphs showing the Project's sensitivity to metal price, operating costs, and capital costs were completed for the Project's pre-tax cash flow, pre-tax NPV@7%, pre-tax IRR, after tax cash flow, after tax NPV@7%, and after tax IRR. Each is displayed in Figure 22-1 through Figure 22-6.

22.5 Comments on Section 22

In the opinion of the QPs, under the assumptions detailed in this Report, the Project has been shown to have a positive cashflow.

Figure 22-1: Pre-Tax Cash Flow Sensitivity Analysis

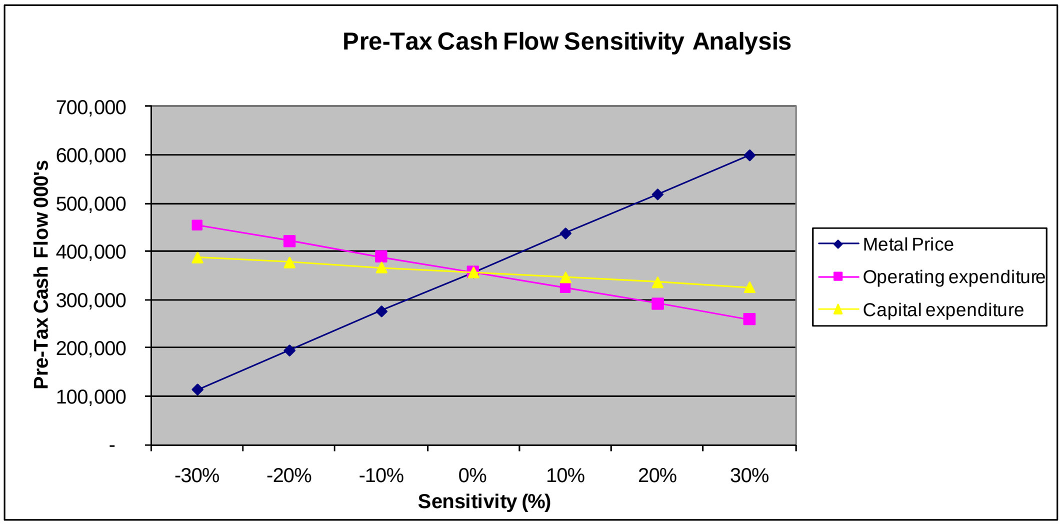


Figure 22-2: Pre-Tax NPV @ 7% Sensitivity Analysis

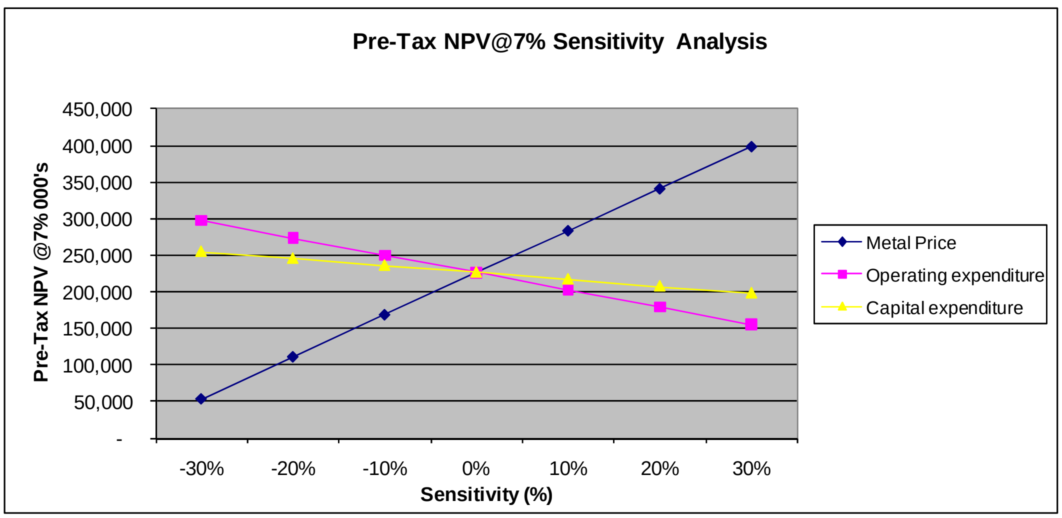


Figure 22-3: Pre-Tax IRR Sensitivity Analysis

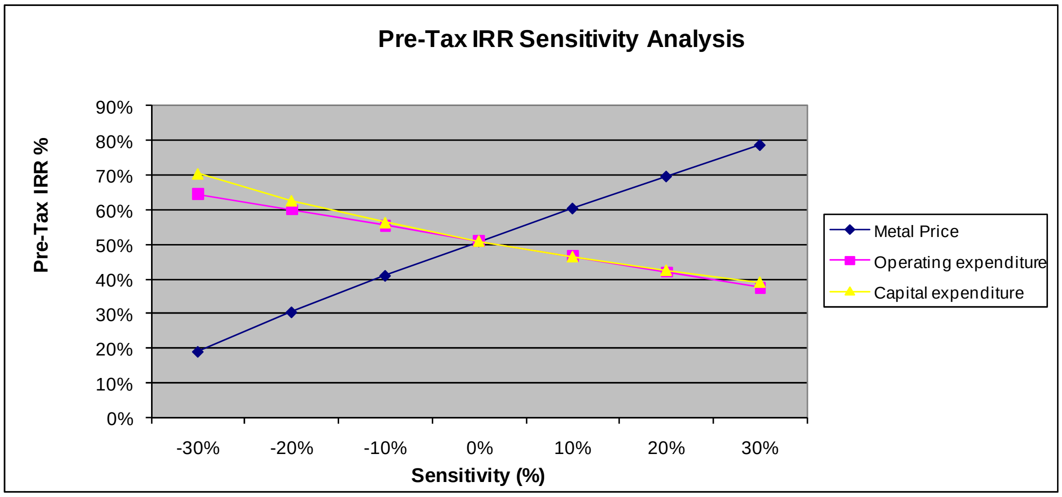


Figure 22-4: After Tax Cash Flow Sensitivity Analysis

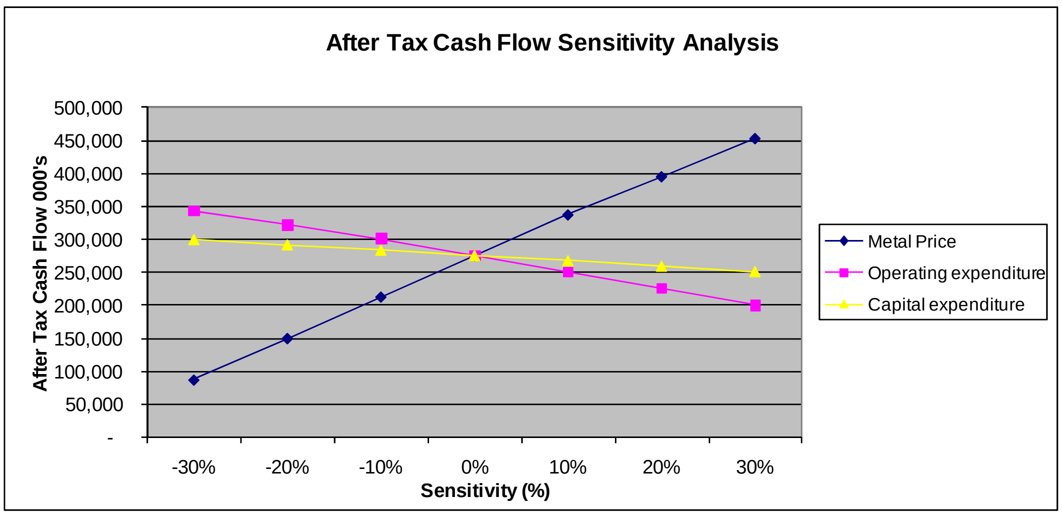


Figure 22-5: After Tax NPV @ 7% Sensitivity Analysis

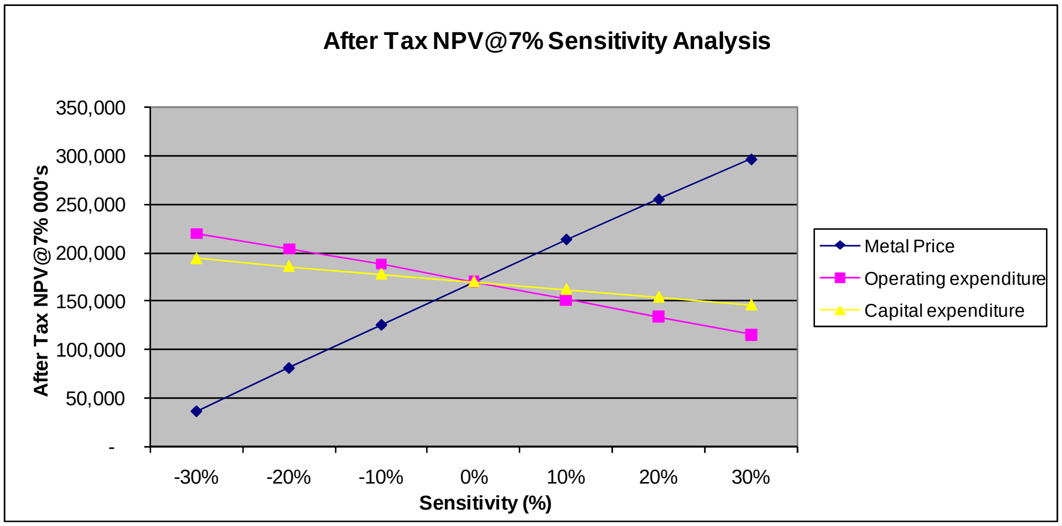
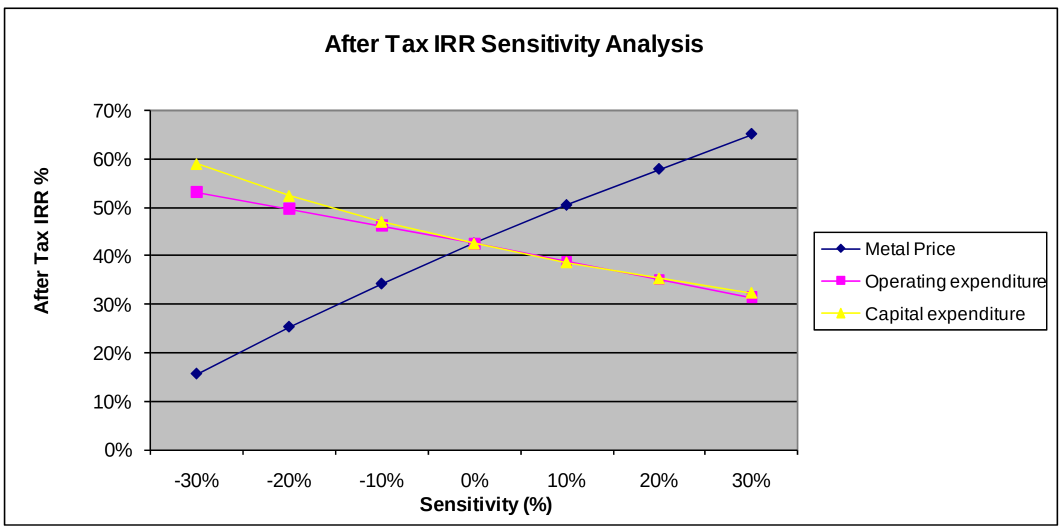


Figure 22-6: After Tax IRR Sensitivity Analysis



23.0 ADJACENT PROPERTIES

There are no adjacent properties that are relevant to the Project.

24.0 OTHER RELEVANT DATA AND INFORMATION

24.1 Risks and Opportunities

AMEC conducted a “Risks and Opportunity” workshop at the mid-point progress meeting of the Gibellini Feasibility Study. During the meeting, the three top risks identified pertained to permitting and selling price. Specifically, the permitting timeline was identified as aggressive in light of staffing difficulties at the permitting agencies, and the vanadium price was noted as conservative due to potential value add products like battery electrolytes which could potentially increase the product selling price by three to four fold.

For the balance of the study, AMEC, American Vanadium, and American Vanadium’s subconsultant, Enviroscientists, worked to mitigate the top risks. That is, to address value add vanadium products, Roskill was contracted to provide a marketing study for vanadium including value add products like battery electrolytes. To address permitting timelines, American Vanadium and Enviroscientists engage the permitting agencies to ensure that the Gibellini environmental permitting program was set to provide the agencies with requisite and timely information.

During the course of the Feasibility Study, American Vanadium identified a calcium boundary at 2.5 percent calcium. American Vanadium contoured this shape and identified that none of the metallurgical holes penetrated it; consequently, the metallurgical columns are in relatively benign material. American Vanadium also noted that the 2.5 percent calcium contour extends into the base of the transition zone included in the mine plan; specifically, in the south–central portion of the deposit the 2.5 percent calcium contour protrudes into the transition zone. This is a Project risk due to the elevated calcium levels and likely elevated acid consumption for this material.

The heap leach design with respect to maximum heap height (affecting the leach pad size), permeability, stability, hydraulics and pond sizing are based on a larger material size, 100% passing 1 ½”, than the study recovery size fraction of ½”. Because recovery results for 2” and ½” material are within one percent (recoveries for material crushed to 2” is approximately one percent less than recoveries for material crushed to ½”), if detailed design work at the ½” size fraction does not support study maximum heap height, permeability, stability, hydraulics and pond sizing results, the implications of crushing to a 1 ½” size fraction and losing one percent recovery is nominal and would result in less than a $7 million loss to the after-tax NPV@7%.

It should be recognized that there are stability risks associated with the scatter in the structure data in that there may be adversely-oriented structures that do not correspond with design discontinuity sets; and potential failure modes associated with secondary discontinuity sets. Further, data from the geotechnical borings were predominately located within the deposit and additional data could be used closer to the flank of the pit limits.

The regulatory permitting process for a vanadium heap leach project may require additional geochemical baseline data collection and closure planning, as this type of project has not been permitted before in the State of Nevada. Although similar to a copper heap leach, also limited in the State of Nevada, no specific regulatory guidelines or procedures have been established for this type of process and therefore agency concurrence with data collection protocols and the determination of data adequacy and closure design may be subject to additional reviews and revisions.

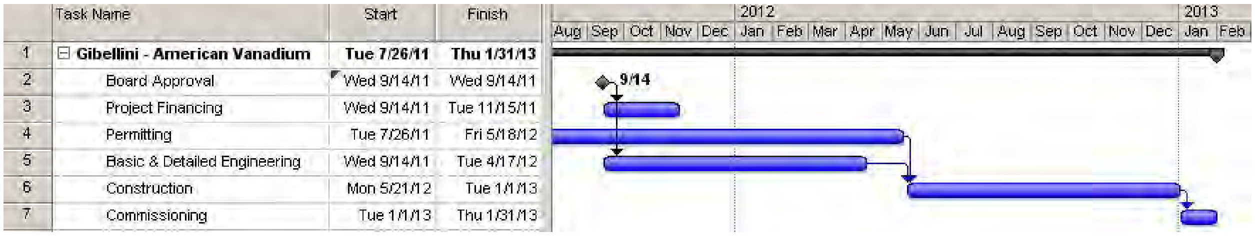
24.2 Project Schedule

A project schedule has been developed as indicated in Figure 24-1. AMEC notes that this schedule is preliminary, as no mine development approval has been granted by the Board of American Vanadium, and the Project has not received the necessary County, State and Federal permits to permit construction, mining, and processing operations.

The anticipated peak site construction labor force is approximately 130 persons.

It is expected that the bulk of the construction will be done in the third and fourth quarters of 2012, with plant commissioning beginning in January 2013.

Figure 24-1: Level 1 Milestone Schedule for Gibellini Project



	Task Name	Start	Finish
1	**Gibellini - American Vanadium**	**Tue 7/26/11**	**Thu 1/31/13**
2	Board Approval	Wed 9/14/11	Wed 9/14/11
3	Project Financing	Wed 9/14/11	Tue 11/15/11
4	Permitting	Tue 7/26/11	Fri 5/18/12
5	Basic & Detailed Engineering	Wed 9/14/11	Tue 4/17/12
6	Construction	Mon 5/21/12	Tue 1/1/13
7	Commissioning	Tue 1/1/13	Thu 1/31/13

25.0 INTERPRETATION AND CONCLUSIONS

In the opinion of the QPs, the following interpretations and conclusions, based on the Feasibility Study, can be reached:

- Information from American Vanadium and legal experts supports that the mining tenure held is valid and is sufficient to support declaration of Mineral Resources and Mineral Reserves.
- There has been no legal survey of the Project claims. Under Nevada law, each unpatented claim is marked on the ground, and does not require survey.
- AMEC was supplied with legal opinion that indicates annual claim maintenance fees have been paid for 2010. American Vanadium has advised that the 2011 maintenance payment, due prior to 1 September 2011, was paid.
- American Vanadium has confirmed that a total of 70 claims are held by way of agreement with third-parties. Royalties are associated with these agreements as follows:
  - Dietrich royalty: 2.5 percent NSR until royalty payments reach a total of $3 million, where the royalty decreases to 2.0 percent.
  - MSM royalty: production royalty of 3.0 percent NSR.
  - Vanadium International royalty: production royalty of 2.5 percent NSR until royalty payments reach a total of $1 million, then the royalty is dropped.
- There is sufficient area within the Project to host an open pit mining operation, including any proposed open pit, waste dumps, and leach pads.
- Any future mining operations can be conducted year-round.
- The Gibellini Project is situated entirely on public lands that are administered by the Bureau of Land Management (BLM). No easements or rights of way are required for access over public lands. Mt Wheeler Power will apply for a right of way for the powerline; it is likely that the water pipeline from the Don Hull Ranch will use the same right of way. It is a reasonable expectation that surface rights to support operations can be obtained.
- Exploration to date has been conducted in accordance with Nevada regulatory requirements. Additional permits will be required for Project development.
- Similarities with the style of mineralization for the Project exist in the USGS manganese nodule model, model 33a of Cox and Singer (1986). The exploration programs completed to date are appropriate to the style of the deposits and

prospects within the Project. The exploration and research work supports the orogenesis interpretations

- Based on XRF data, the Project retains significant exploration potential, and additional work is planned.
- Knowledge of the deposit settings, lithologies, and structural and alteration controls on mineralization, and the mineralization style and setting is sufficient to support Mineral Resource and Mineral Reserve estimation.
- All legacy drill and trench data in the Gibellini Project resource database were entered by AMEC and accurately represent the source documents. Documentation of drilling methods employed by the various legacy operators at Gibellini is sparse. No cuttings, assay rejects, or pulps remain from these drilling campaigns. No records remain for the drill sampling methods employed by NBGM (core), Terteling (rotary), or Atlas (rotary). Noranda and Inter-Globe collected drill samples on five foot intervals. American Vanadium has performed drill twins on selected Noranda and Atlas drill holes. For portions of the legacy data, the names of the laboratories that performed the assays are known; however, no information is available as to the credentials of the analytical laboratories used for the drill campaigns prior to the RMP drilling.
- Drill data collected by American Vanadium meets industry standards for exploration of oxide vanadium deposits. No material factors were identified with the drill data collection that could affect Mineral Resource or Mineral Reserve estimation. RC and core methods sampling employed by RMP and American Vanadium are in line with industry norms. Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure for the RMP and American Vanadium drill programs. The RMP and American Vanadium core and RC samples were analysed by reputable independent, accredited laboratories using analytical methods appropriate to the vanadium concentration. Drill data are typically verified by AMEC prior to Mineral Resource and Mineral Reserve estimation, by running a software program check.
- Drill sampling has been adequately spaced to first define, then infill, vanadium anomalies to produce prospect-scale and deposit-scale drill data. Drill hole spacing varies with depth. Drill hole spacing increases with depth as the number of holes decrease and holes deviate apart. Drilling is more widely-spaced on the edges of the Gibellini Hill and Louie Hill deposits. Sample data collected adequately reflect deposit dimensions, true widths of mineralization, and the style of the deposits.
- AMEC completed a database audit in 2008. Conclusions from that audit were that the data were generally acceptable for Mineral Resource estimation. Data made

available after the 2008 review were audited in 2010. Conclusions from that audit were that corrections were required to Noranda and Atlas assay data, and that additional twin holes should be drilled to verify Atlas data.

- Metallurgical testwork and associated analytical procedures were performed by recognized testing facilities, and the tests performed were appropriate to the mineralization type.
- Samples selected for testing were representative of the various types and styles of mineralization at Gibellini Hill. Samples were selected from a range of depths within the deposit. Sufficient samples were taken to ensure that tests were performed on sufficient sample mass.
- The process recovery for the feasibility column test worked showed a slow ascending trend of between 0.1 percent and 0.4 percent per day, which was consistent with the trend seen in the 2008 PA column test work.
- Life-of-mine average recoveries are 60 percent for Oxide material and 70 percent for Transition material.
- The acid leaching did not mobilize any elements during leach that is deleterious to the solvent extraction recovery. The major elements mobilized were aluminum, phosphorus and iron.
- No processing factors were identified from the metallurgical testwork that would have a significant effect on extraction.
- AMEC notes that commercial heap leaching and solvent extraction (SX) recovery of vanadium ores has not been done before; nonetheless, heap leaching and SX recovery are common technologies in the mining industry. The most notable examples are the multiple copper, nickel, and cobalt heap leach projects that utilize an acid-leach solution to mobilize the metal followed by recovery in a SX plant, which is then followed by electro-winning. The Gibellini process applies the same acid heap leaching and SX technology to recover vanadium. However, instead of electro-winning to produce a final product, the Gibellini process will utilize an acid strip followed by precipitation to produce a final product.
- The Mineral Resource estimates for Gibellini Hill and Louie Hill, which have been estimated using RC and core drill data, have been performed to industry best practices, and conform to the requirements of CIM (2010). Factors which may affect the Mineral Resource estimates include commodity price assumptions, metallurgical recovery assumptions, pit slope angles used to constrain the estimates, assignment of oxidation state values and assignment of specific gravity values.

- The Gibellini Hill resource model has a known error that has effectively reduced the overall grade for Measured and Indicated by approximately one percent. Adjustment to Atlas's transition assays between zero percent and 0.410% V_2O_5 were implemented twice. AMEC reran the model with the correction and the results indicate an approximate error of one percent. AMEC is of opinion that this error is not material to the estimate.

- Mineral Reserves for Gibellini Hill have been modified from Mineral Resources by taking into account geologic, mining, processing, and economic parameters and therefore are classified in accordance with the 2010 CIM Definition Standards for Mineral Resources and Mineral Reserves. Factors which may affect the Mineral Reserve estimates include commodity price assumptions, leach recoveries of the identified oxidation ore types may prove to be higher or lower than modelled, and the presence of a calcium boundary at 2.5 percent calcium, which may affect metallurgical recovery.

- The proposed Project will be a conventional open-pit operation with an annual throughput rate of three million ton per annum. The mine plan mines four separate phases from one open pit at Gibellini Hill. The SMU block size of block size at 25 feet x 25 feet x 20 feet reflects the selectivity of the proposed open pit mine rate. The bench height of 20 feet, minimum mining width of 75 feet in the pit bottoms and 100 feet on benches, and pit ramps sizes at 85 feet for two-way traffic and 50 feet for one-way traffic, and an inclination of 10 percent are appropriate to the mine design and leaching rate envisioned.

- The fleet will 14.5 cubic yard FELs and trucks operated by a Contractor. Mining equipment requirements are based on the mine production schedule and equipment productivities, and included consideration of workforce and operating hours. The fleet is appropriate to the planned production schedule.

- The design for the process plant is based on processing the mined material through a heap leach operation using heap-leach technology and standard proven equipment. Commercial heap leaching and SX recovery of vanadium ores has not been done before; nonetheless, heap leaching and SX recovery are common technology in the mining industry. The process design is based on the metallurgical testwork and is appropriate to the crush and recovery characteristics defined for the different oxidation states of the mineralization. Reagent requirements have been appropriately established for the operational throughput. Process water requirements have been appropriately considered in the design process. Water will be sourced from wells. Power requirements can be met by the proposed powerline capacity.

- An ongoing bench-scale column test is producing battery grade electrolyte. There is an opportunity to improve the Project economics by producing and marketing a battery grade electrolyte which sells at a premium to V_2O_5.
- The heap leach pad design is based on appropriate geotechnical testwork; stormwater considerations are dictated only by direct precipitation falling on the facilities.
- Infrastructure to support the Gibellini project consists of site civil work, site facilities/buildings, a water system, and site electrical. Infrastructure considerations are appropriate to the mining method and projected process route. Supply of offsite power and water is required. A well field has been identified at the Don Hull ranch. Power will be supplied by a local utility, Mt Wheeler Power.
- AMEC reviewed the Roskill marketing study and has accepted the realized selling price over the life of the project indicated by Roskill. AMEC reviewed the proposed marketing strategy, and considers it appropriate to the product that American Vanadium will generate at Gibellini Hill.
- Capital costs have been appropriately estimated and are based on a combination of quotes, vendor pricing, and experiences with similar-sized operations. The estimate for AMEC's scope is considered to be at a feasibility level with an expected accuracy range of -10 percent to +15 percent, and includes a contingency. The total estimated cost to construct, install and commission the facilities described in this Report is US $95.5 million. It is important to note that economic conditions at this time are fluctuating, and the costs presented here are not necessarily the lowest nor the highest quoted, but use the best judgment of the estimator.
- Operating costs have also been appropriately estimated and are based on a combination of quotes, vendor pricing, and experiences with similar-sized operations. Annual operating costs average approximately $48 million per year with the exception of Year 1 and Year 7, the start-up and decommission years respectively. Annual cost fluctuations during Year 2 through Year 6 are primarily the result of changes in the waste mining quantities
- Based on AMEC's financial evaluation, the Gibellini Project generates positive financial results. Using a discount rate of seven percent, the pre-tax net present value (NPV) is $226.3 million and the internal rate of return (IRR) is 51 percent. The after tax NPV is $170.1 million and the IRR is 43 percent. Payback for the Project is estimated at 2.06 years and 2.38 years for the pre-tax and after tax scenarios respectively.
- The Project is most sensitive to changes in metal prices as well as recovery and head grade, and less sensitive to changes in capital and operating costs.

- The major risks to the Project were considered to be marketing and permitting. Specifically, the permitting timeline was identified as aggressive in light of staffing difficulties at the permitting agencies, and the vanadium price was noted as conservative due to potential value-add products such as battery electrolytes which could potentially increase the product selling price by three- to four-fold.

26.0 RECOMMENDATIONS

AMEC has developed the following recommendations to help mitigate Project risks and provide a reasonable position on the Project for the American Vanadium Board to make a decision on mine development.

The recommendations are envisaged as a single-stage program, with no area of work dependent on the results of another. Some aspects of the program are already underway. The recommended budget to address the work is approximately $1.13 million. AMEC notes that the work program budget is incorporated in the capital cost estimate outlined in Section 21 of the Report.

American Vanadium has advised AMEC that the engineering, procurement, and contract management contract, which is estimated to be about $8 million, has been awarded. American Vanadium may choose to undertake some of the recommended work program activities as part of the EPCM process.

26.1 Geology, Block Modeling, and Mineral Resources

- Update data on the drill logs when new data are collected or the old data are revised or reinterpreted
- Document relogging efforts and place updated copies of drill hole logs in the drill log folders
- The insertion rates of the control samples are low when compared to industry best practice; the insertion rate of SRMs, duplicates, and blanks should be increased to five percent each
- Additional condemnation drilling is recommended at the sites of the planned waste dump and building facilities
- The reduced mineralization should be re-classified with respect to resource confidence categories once metallurgical test work data on projected recoveries from this material are available
- Twin drill an additional four to five Atlas drill holes through the transition zone and evaluate the results in conjunction with the previous completed twins
- Test and evaluate the potential for high-angled structures to carry elevated vanadium grades by drilling a series of angled drill holes.

The total cost to carry out this program of work is projected to be approximately $300,000 to $350,000, depending on the amount of condemnation and angled drilling.

26.2 Geotechnical, Mining, Infrastructure, and ARD

- The engineering and maintenance of a safe and efficient mining operation requires an ongoing data collection program. Since the structural features of the rock mass will have a major impact on the slope stability of the benches, as of this report, the actual orientation, length, and location of continuous major structures must be continually observed and measured in the field. Geologic field studies must be continuously updated as the excavation progresses and new bench faces are exposed. These activities, in conjunction with a laboratory testing program, will aid in optimizing the pit design further for more aggressive bench face angles in the future
- Complete load/perm test work and stability analysis during detailed design to support a leach pad design for a nominal ½" sized product.
- Complete kinematic testing and reassess need to construct a liner under the waste dump.
- During the detailed design site investigation, identify a durable aggregate source for use in road construction and road maintenance closer to the open pit.
- In the contract mine RFP, request an option for the mine contractor to provide their own surface facilities including: truck shop, warehouse, wash bay, fuel island, powder storage, and offices.
- Assess the viability of contracting crushing and stacking operations to the mine contractor.
- Complete a crusher test at the rhyolite source to determine a crush index and to determine the percent reject to manufacture each product. The study assumes 20 percent reject.
- During detailed design, completed a trade off of replacing the freshwater tank and firewater tank with a water storage pond.
- Assess constructing the freshwater and firewater tanks at a lower elevation to eliminate the pressure reduction valves.
- Due to the large contour interval of the flyover topography and the size of the site, the quantity estimate, while sufficient for a Feasibility Study, should not be considered accurate enough for final design. A GPS survey should be performed by American Vanadium to establish a more precise base-map which would facilitate final design and provide more accurate bid quantities.
- Complete detailed laboratory work to determine the thickness of the leach pad ET cover.

- Identify a water source closer to the mine site. Currently, water is coming from the Don Hull ranch located 14 miles away.
- Assess using a local source of limestone to cover the leach pad during closure. This will help buffer the acid within the pad and will reduce the amount of rinsing and caustic soda addition.

The total cost to carry out this program of work is projected to be about $300,000 to $350,000.

26.3 Process, Metallurgy, and Water Treatment

- Model calcium and build an acid consumption model based on calcium levels.

The total cost to carry out this program of work is projected to be about $20,000.

26.4 Project Execution

- Develop and permit the two monitor wells located adjacent to site for construction water use
- Investigate using a design build contractor for the site buildings
- Combine the site civil work with the mine contract work in order to obtain favorable unit pricing for both.

This work program would be part of EPCM activities.

26.5 Permitting, Environmental, and Social

- Collect additional baseline data, collect additional closure support data, and coordinate with the permitting and authorizing agencies to fully develop a closure and reclamation scenario
- For reclamation and closure planning, consider community expectations, historic preservation requirements, site cleanup, and environmental restoration
- Continue coordinating with the permitting agencies frequently throughout the process to increase the efficiency and quality of submittals and project reviews
- Engage local tribes early in the planning stages of the Project

- Build relationships with local government officials and gather their input to create a community partnership for the Project
- Communicate and encourage public participation from the local community prior to construction of the project and throughout operations to gain insight on the potential positive and negative effects of the Project on the community
- Utilize local products and services when feasible throughout the life of the Project
- Hire or contract a public relations specialist to develop a project communication plan
- Develop an employee and contractor training program to educate workers of the sensitive resources and environmental protection measures established for the Project.

The total cost to carry out this program of work is projected to be approximately $500,000.

26.6 Costs

- Complete a lease or purchase agreement for a rail head load out in Elko or Carlin for shipping the final product,
- Negotiate firm pricing for product conversion, product shipping, and product marketing costs,
- Negotiate a memo of understanding (MOU) with Eureka county for access road maintenance,
- Assess powdered iron purity requirements and costing to reduce the unit cost of $0.74 per pound for powdered iron used in the study, and
- Negotiate long term sulfuric acid pricing that is more favorable than the study price of $162.5 per ton.

The total cost to carry out this program of work is projected to be about $10,000.

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