BISONI McKAY VANADIUMPROPERTY

Nye County, Nevada

Phase II Technical Report

for

Stina Resources Ltd.

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(Amended August 29, 2016)

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ITEM 1 – SUMMARY

In June of 2007, Edwin Ullmer, Consultant Geologist from Westminster, Colorado was engaged by Stina Resources Ltd, (Stina) based in Richmond, BC to prepare Canadian National Instrument (NI) 43-101 Technical Report on the Bisoni McKay Vanadium property in Nye County, Nevada, U.S.A. in accordance with the reporting requirements of NI 43-101. This report is based on information from exploration programs by mining and geological professionals, a review and interpretation of existing data and documents from previous mineral exploration programs, and a metallurgical study by Stina. Stina acquired the Bisoni McKay property and previous exploration data in April of 2005, from Vanadium International Corporation (VIC), Reno, Nevada. The author is responsible for the review and preparation of the following Technical Report. Jim Wall, Controller of Stina, provided all available reports and data records from files of previous exploration and Stina-funded exploration from 2004 to present. Much of the latter information was generated and collected by the late John James, coauthor of the 2005 and 2006 Technical Reports. He was a mining engineer and principle of JAMines Inc. based in Lakewood, Colorado, U.S.A.

Edwin Bentzen, an Extractive Metallurgist and an Associate of Resource Development Inc. is responsible for 13, 17, 21, 22, and portions of Items 1, 2, 3, 25 and 26, the portions relating to mineral processing. Mr. Bentzen was engaged by Stina Resources, as part of the Phase II completion to assess the technical aspects of the mineral process studies. This report addresses the results of Phase II assessment. The earlier scoping-level study undertaken by Hazen Research Inc., demonstrated that a technically viable process consisting of; oxidizing roast (possibly a salt roast), followed by acid pugging, curing and leaching with concentrated sulfuric acid, will provide good vanadium extraction from all three mineralized composite samples studied

The Bisoni McKay (BMK) vanadium property is located in the northern limits of Nye County in central Nevada near the Eureka County south boundary (Figure 1A). The property is situated about 40 miles south of the town of Eureka and about 130 miles due south of Carlin, Nevada. The claims are located within Township 14 N. and Range 52 E. in Sections 8, 17, 18, 19 20, and 30. The prospect is approximately centered on the intersection of latitude 39°04'45"N and longitude 116°08'00"W.

The property position consists of 37 contiguous lode claims on Bureau of Land Management administered land comprising an area of 754.13 acres (305.42 hectares) (Figure2). The assessment obligations to the U.S. Department of the Interior – Bureau of Land Management for the Jeanette, Nan, Kitty, Willow, and the Ginsu lode claims: they are current and valid through September 2016.

Recorded minerals interest near BMK around the property began in 1942 with the discovery of nickel, zinc, manganese, and cobalt mineralization next to what is now the Gibellini Hill prospect, located about 10 miles north of the Bisoni McKay property (Figure 1A). After some studies by the U.S. Bureau of Mines in the 1940s, Union Carbide discovered vanadium in shale in 1956 north of BMK on what came to be known as the Bisoni Prospect. Following this, a succession of mining companies in the 1970s and 80s, including Noranda, Hecla, and TRV-Inter-Globe Resources, explored on and around the Bisoni McKay property. In 1993 when the original block of claims lapsed, the prospect was subsequently restaked by VIC. Stina optioned the property in 2005. The group of vanadium prospects became known as the Central Nevada Vanadium Belt.

The vanadium mineralization is hosted by carboniferous shale and oxidized (weathered) carbonaceous shale that is part of the Devonian Woodruff Formation. The subunit that hosts the vanadium mineralization at BMK and the other nearby vanadium prospects is known as the Gibellini facies. The mineralization is syngenetic and occurs as a single stratabound and strataform body of anomalous vanadium-bearing beds that approaches an estimated 300 feet thick where measured from a drill hole section in Area A of BMK within the oxidized and reduced carbonaceous shale facies. The past drilling programs at BMK have not included borings to explore the Woodruff strata down dip and at greater depth for additional mineralized facies. The vanadium-rich strata typically occur as a contiguous series of beds estimated to be up to 300 feet thick. The strike of the dipping beds is due north-south, and dips are usually eastward. In the north half of Area A (Area A North), the area of concentrated drilling in 2007, the recorded surface dips range from near vertical and possibly overturned on the western side of the trench exposures to flatter 60^{o} east slope on the east end of the trenches and possible less farther east (see Figures 4 and 23-B). The steep dips are likely the result of vertical rotation of the Woodruff during faulting along the north-south faults. Vanadium minerals are seldom seen macrcoscopically, and only the more colorful secondaries are occasionally observed as very fine disseminated grains. Vanadium is the only economic commodity. Other metals or anions commonly anomalous in carbonaceous (organic) black shale world-wide such as copper, zinc, molybdenum, uranium, chromium, selenium, and phosphate occur as trace or geochemical anomalies but quantities usually are not of economic interest.

Stina began Phase I field work in 2004 that continued through 2005 and included reverse circulation (RC) drilling, diamond drill holes (DDH) for core recovery and trench sampling. Two Technical Reports were completed for the combined 2004 and early 2005 field work and for the later 2005 effort. The latter report, dated April 16, 2006, provides the background for this report of the 2007 Phase II drilling results and vanadium resource and the initial metallurgical study. See Figure 3 for Stina and Hecla drill holes. The Phase I and Phase II programs have been completed.

The initial stage of the Phase II field work, which is of primary concern in this Technical Report, consisted of twelve reverse circulation (RC) holes that were all sited in the vanadiferous shale trend on Area A North. See Figures 2 and 24 for Area A North location. Three RC holes and three diamond drill core holes had been previously sited on Area A North in 2005, as well as three RC holes at the south half of Area A (Area A South, see Figure 23-A). The concentration of the 2007 drilling within a relatively small portion of the project area was designed to evaluate and characterize the vanadium continuity, grade distribution, and spatial characteristics of the vanadiferous beds in a limited area that would give cogent information for planning exploration and development on other parts of the property.

The data from 2007 drilling of twelve RC holes and the six 2005 RC holes, combined with the three 2005 core holes in Area A, has provided evidence of sufficient continuity of the strataform V_2O_5 mineralization to compute indicated resource tonnage at 0.2% and 0.3% cutoffs for the north half of Area A, and an inferred resource at the latter cutoffs for parts of the north and south half (see Table 1 and Figure 23-B). The Maptek Vulcan block modeling program was used for the resource estimates. The resources are restricted to the limited area drilled in Area A which should not be considered a complete assessment of the Area. The drilling and interpreted subsurface geology indicates additional vanadiferous shale will likely continue stratigraphically down-dip as well as north and south of the drilled grid lines. In October of 2015 Stina carried out a survey control check of the drill hole locations to corroborate field data as part of the completion of Phase II. The small location discrepancies on several drill holes prompted another resource calculation on the north block of Area A by Maptek using the same assay data as the earlier resource calculation. (See Section 19.5 below)

Area A-North: The 2015 calculations of grade estimation and tonnage using Vulcan software resulted in indicated resources of combined oxide and reduced mineralization at the 0.2% cutoff in the north half of Area A of 11,879, 590 tons (t) of indicated resource at 0.39% V_2O_5 (refer to Table 1, Table 16 and Figure 1B). Mineralization at a cutoff of 0.2% converts to 7.2 lbs of V_2O_5 per ton. Table 16 includes the tons for the indicated and inferred mineralization at the 0.2% and 0.3% cutoffs in Area A-North, the target area for last phase of concentrated drilling at BMK in 2007.

In 2007 Hazen Research investigated the metallurgy and mineralogy of the vanadium-bearing strata and the initial tests for vanadium recovery. The mineralogical characterization of the mineralized stratigraphy includes the identification of carbonaceous, transition, and oxide zone. The four part experimental program to extract the vanadium include: 1) concentration of vanadium by magnetic separation, 2) the direct leaching of oxidized mineralization with three lixivants, 3) acid pugging and curing on all mineralization types followed by leaching, and 4) oxidizing roasting and salt roasting of carbonaceous and transition mineralization and subsequent leaching. The last mineral processing test was the most successful with 74% recovery of V_2O_5 from the carbonaceous (reduced) zone.

TABLE 1
RESOURCE SUMMARY

	0.2% Mineralized Cutoff	0.3% Mineralized Cutoff
	Indicated Resource - Area A North	
Tons	11,879,590@ 0.39% V_20_5	10,253,330 @ 0.40% V_20_5
	Inferred Resource for Area A North and South Halves	
Tons	7,048,056 @ 0.42.% V_20_5	5,602,244 @0.40. % V_20_5

ITEM 2 - INTRODUCTION

This report provides an independent evaluation of the exploration on the Bisoni McKay (BMK) vanadium project, Nye County, Nevada. The property was optioned by Stina Resources Ltd. (Stina), Vancouver, British Columbia from Vanadium International Corporation (VIC), Reno, Nevada. This report was prepared for Stina under the terms set out in NI 43-101 to include the latest exploration drilling and metallurgical tests in 2006 and 2007 and documents a new resource estimate. For this report, unless otherwise stated, the common macro-units of measurement will follow the American-English system of feet and miles, pounds and tons, temperature (Fahrenheit), land area – acres, etc Financial matters will be expressed in American dollars or, when appropriate, in Canadian dollars.

Stina optioned the property on January 21, 2005 because previous exploration results on the property indicated the potential for grade and tonnage of vanadium mineralization that could be profitably mined at current and/or projected market values. This report stresses the 2007 Phase II work completed as well as much of the relevant 2005 Phase I exploration covered in the April 16, 2006 Technical Report.

To report on the 2007 exploration, Stina engaged author Ullmer in June 2007 to amend and revise the previous NI 43-101 Technical Report of the Bisoni McKay Vanadium Property dated April 16, 2006. As a contract geologist, Ullmer also coauthored the latter report, was the on-site drilling supervisor during the October-November 2005 drilling program, and undertook other field work including geological mapping on the project. Also the summary, introduction, and property location sections were modified for clarity and economy. Ullmer's last two visits to the Bisoni McKay property were on June 1-4 2010 to assist surveyors locating survey sites including drill holes, and on October 5 to October 9, 2015 to deal with property matters, to confirm drill hole survey data and to maintain Stina's sample and equipment storage warehouse in nearby Eureka, NV, as part of the completion of Phase II.

Ullmer reviewed the new drilling information including lithology logs, analytical data from ALS Chemex of Vancouver, BC and the metallurgical tests from Hazen Research Inc. (HRI), of Golden, Colorado. The new data has been assimilated with the previous information. An experienced mineral exploration geologist conducted the 2007 drill supervision and logging. The drill hole locations had been planned in advance by the late John James, mining engineer and coauthor of the April 16, 2006 Technical Report as well as the former project manager. The new holes were based on results of the 2005 drilling program, and were located to detail and confirm the grade and geologic continuity for a resource assessment on a portion of the northern-most area, also identified as Area A which is part of the broad vanadiferous shale trend on project claims. Stina completed the twelve reverse circulation holes in April-May 2007 totaling 4,940 feet (1505.7 meters). They were the initial stage of the Phase II exploration program. The sample results from these holes as well as several from the 2005 program were used to achieve a resource estimate for the limited area investigated in Area A.

In October of 2015 Edwin Bentzen, an extractive metallurgist, and Associate of Resource Development, Incorporated, Wheat Ridge, CO, was contracted by Stina Resources to review the laboratory studies conducted by HRI and prepare a technical assessment of the leaching studies and suggested process flowsheets for this Report. Mr. Bentzen reviewed the HRI report entitled "Vanadium Extraction Experiments on Bisoni-McKay Ore Samples, Project 10407", by Dave Baughman, Senior Project Engineer, dated January 31, 2007, for his technical evaluation of the process to extract vanadium from the samples (see Item 13 below)

The United States Geological Survey ("USGS") and the Nevada Bureau of Mines ("NBM") have a considerable body of published data related to the Central Nevada Vanadium Belt in Eureka and Nye Counties, Nevada. Other historic data reviewed in association with preparation of this report include data available to the public, in private company reports, and reports and documents held by JA Mine (the late John James, president) the company formerly managing the project. The data reviewed are listed in the "References" section of this report.

Current vanadium economics: Throughout part of 2005 V_2O_5 prices rose to exceed $20/lb. In January 2006, U.S. domestic pricing for V_2O_5 fell to between $US8.25 and $US8.86/lb compared with a range of $US8.92 to $US9.72 in December 2005. The V_2O_5 price on January 10, 2008, as included in the 2008 Technical Report, remained between $US8.00 and $US9.00/lb (see Northern Miner quotes). The latest reference price in the Northern Miner on October 27, 2014, and included in an earlier Technical Report revision was $US5.50/lb. Vanadium is no longer consistently quoted in V_2O_5, but ferrovanadium prices have remained relatively stable since that period. Discussions in 2015 and 2016 Northern Miner issues have noted these long time stagnant vanadium prices, and noted that they may have found their bottom level, could potentially start to increase again, and that such an increase may predicate on the improvements in vanadium battery technology. This report does not include any economic calculations to prove the current market viability of the BMK deposit at this time. Thus no adjustments are required in the report that reflects the present V_2O_5 price. The current price at this time is considered a historic factor that must be dealt with during future mine planning and V_2O_5 recovery costs in future technical reports.

ITEM 3 – RELIANCE ON OTHER EXPERTS

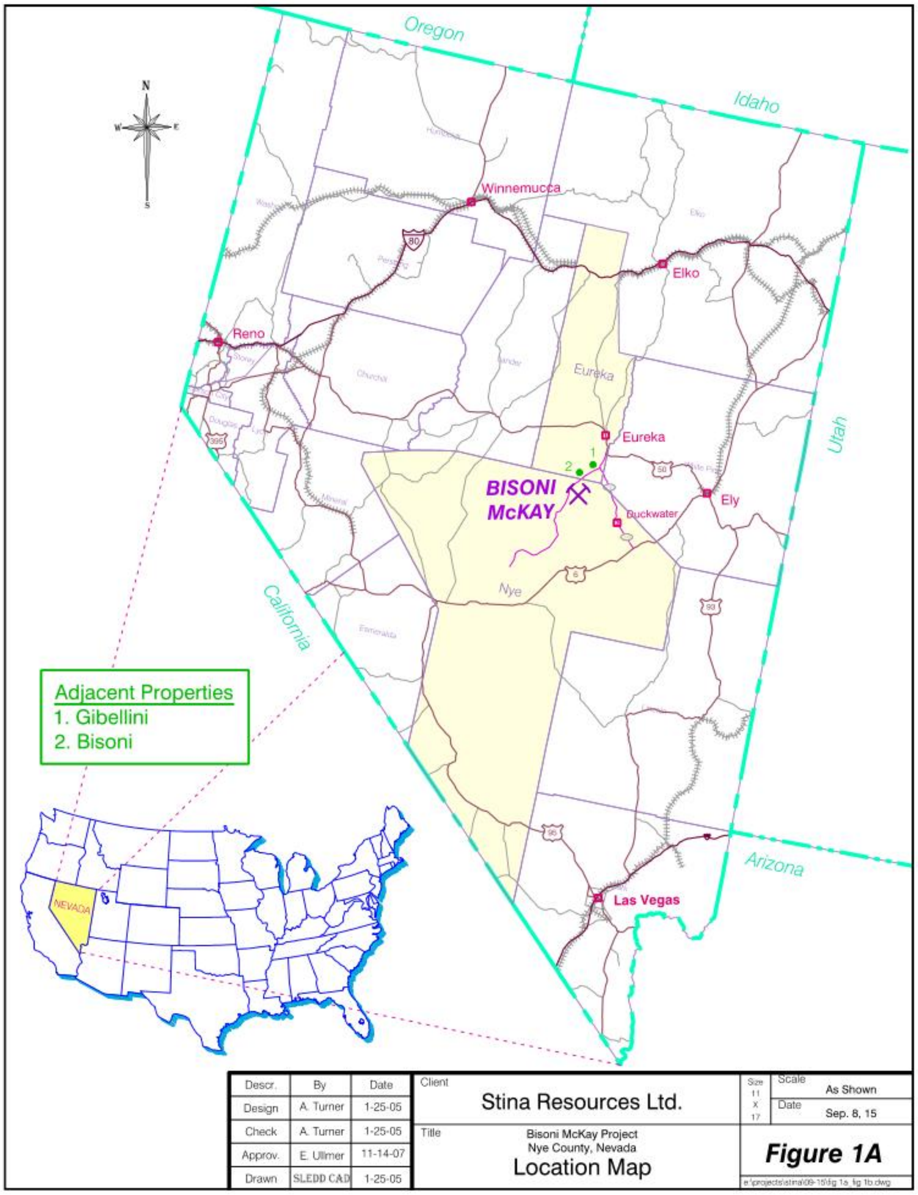
Stina requested that Edwin Ullmer, the qualified person (QP) and author review the Bisoni McKay project data and prepare this Technical Report of the project. The report has been prepared under the guidelines of National Instrument 43-101 and is to be submitted as a Technical Report to the TSX Venture Exchange ("TSX") and the British Columbia Securities Commission (BCSC) as a revised report of the previous January 20, 2008 Technical Report.

The author prepared this report based upon BMK information believed to be accurate at the time of completion, but which is not guaranteed. The author has relied on the validity but remains responsible for using geologic observations and interpretations in part by Stina and VIC professionals, and on experienced contractors to perform analytical work (ALS Chemex), metallurgical testing for vanadium recovery (Hazen Research, Inc.), and in the collection of mineral resource data using the Vulcan program (KRJA Systems, Inc. dba Maptek), and an initial economic evaluation of vanadium mining and mineral processing operations. All the contracting organizations that Stina has employed are either certified and/or have extensive professional credentials in the mining industry. The geologists and mining engineers that have worked on the project also have long professional histories. Reliance is also placed on collected historic exploration documents and data if the results are comparable to observations made by Stina's work effort. The historic information comes from operating companies such as Union Carbide Nuclear Corp., Noranda, Hecla Mining Company, TRV Minerals, Inter-Globe Resources, and from U.S. government and industry published sources including the USGS. The available historic analytical data was considered to be reliable as an influential exploration aid; most of it matched the tenor of Stina's geochemical data. The historic data is not included in the NI 43-101 indicated and inferred resource estimation discussed in the "Mineral Resource and Mineral Reserve Estimate" section.

ITEM 4 - PROPERTY LOCATION AND DESCRIPTION

There has been no change of the property disposition since the April 16, 2006 43-101 Technical Report for the Bisoni McKay Project except to add that the title report has been provided by Thompson, Harris, and Failers, Attorneys and Counselor at Law, located at 6121 Lakeside Dr., Reno, Nevada, 89511 (Ph. [775] 825-4300). The claim renewal documents to date are included in Appendix 1 of this document. The location map on the property, Figures 1A and 1B are included below. The claims are under Nevada Bureau of Land Management (BLM) jurisdiction.

The BMK claim block is located in the northeastern part of Nye County, Nevada about 5.miles south of the Eureka County line. The claim block lies entirely within T14N, R52E within sections 17, 18, 19 , 20, 29, 30. Approximate Area A section on is centered on UTM coordinate N4226000m, E73600 m. The site is located on the Snowball Ranch 1:24000 USGS 1990 quadrangle.


Oregon
Idaho
Utah
Arizona
California
Winnemucca
Elko
Reno
Eureka
Eureka
Ely
Duckwater
Nye
Las Vegas
BISONI
McKAY
NEVADA
Adjacent Properties
1. Gibellini
2. Bisoni
Descr. | By | Date
Design | A. Turner | 1-25-05
Check | A. Turner | 1-25-05
Approv. | E. Ullmer | 11-14-07
Drawn | SLEDD CAD | 1-25-05
Client
Stina Resources Ltd.
Title
Bisoni McKay Project
Nye County, Nevada
Location Map
Scale As Shown
Date Sep. 8, 15
Figure 1A

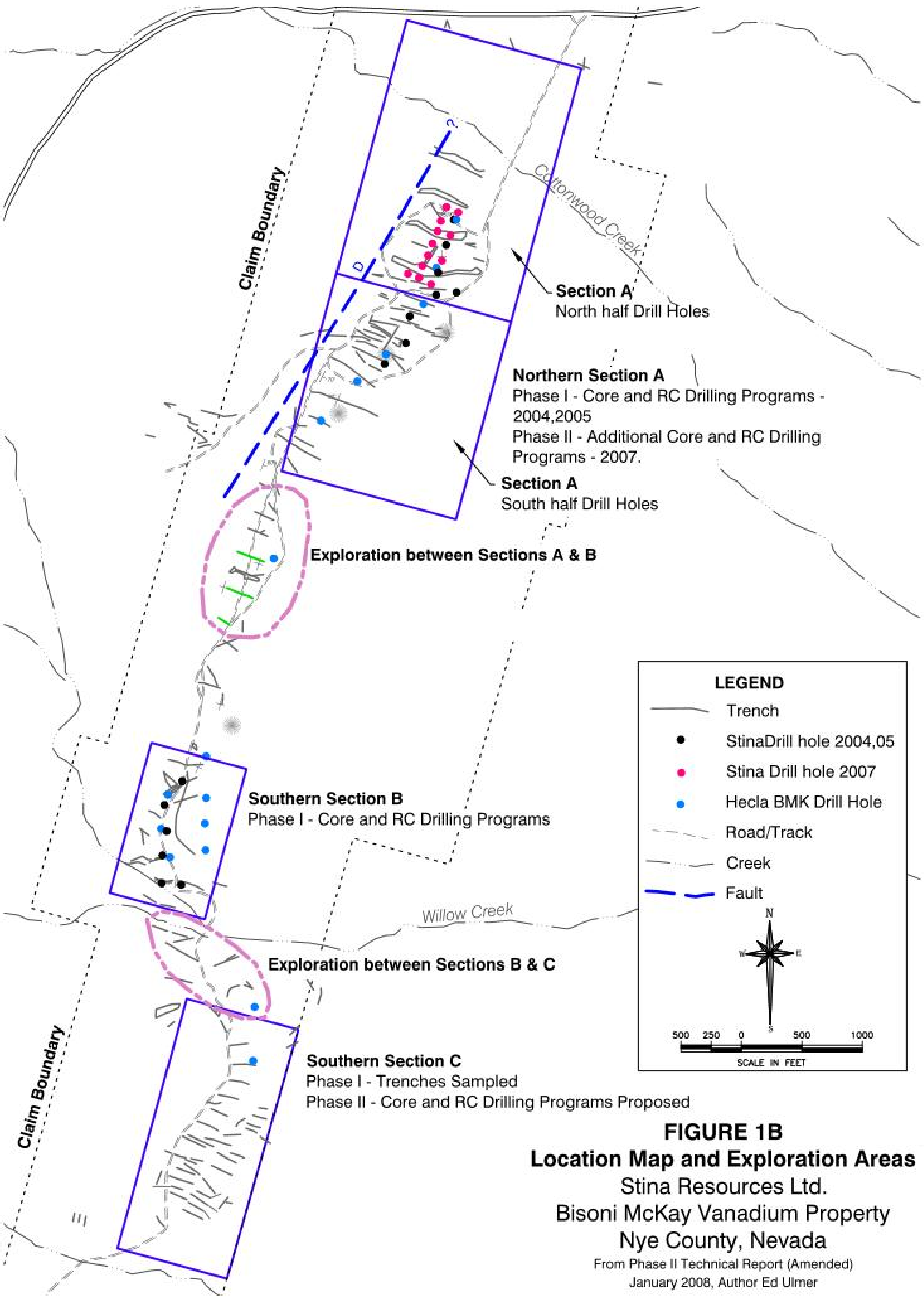
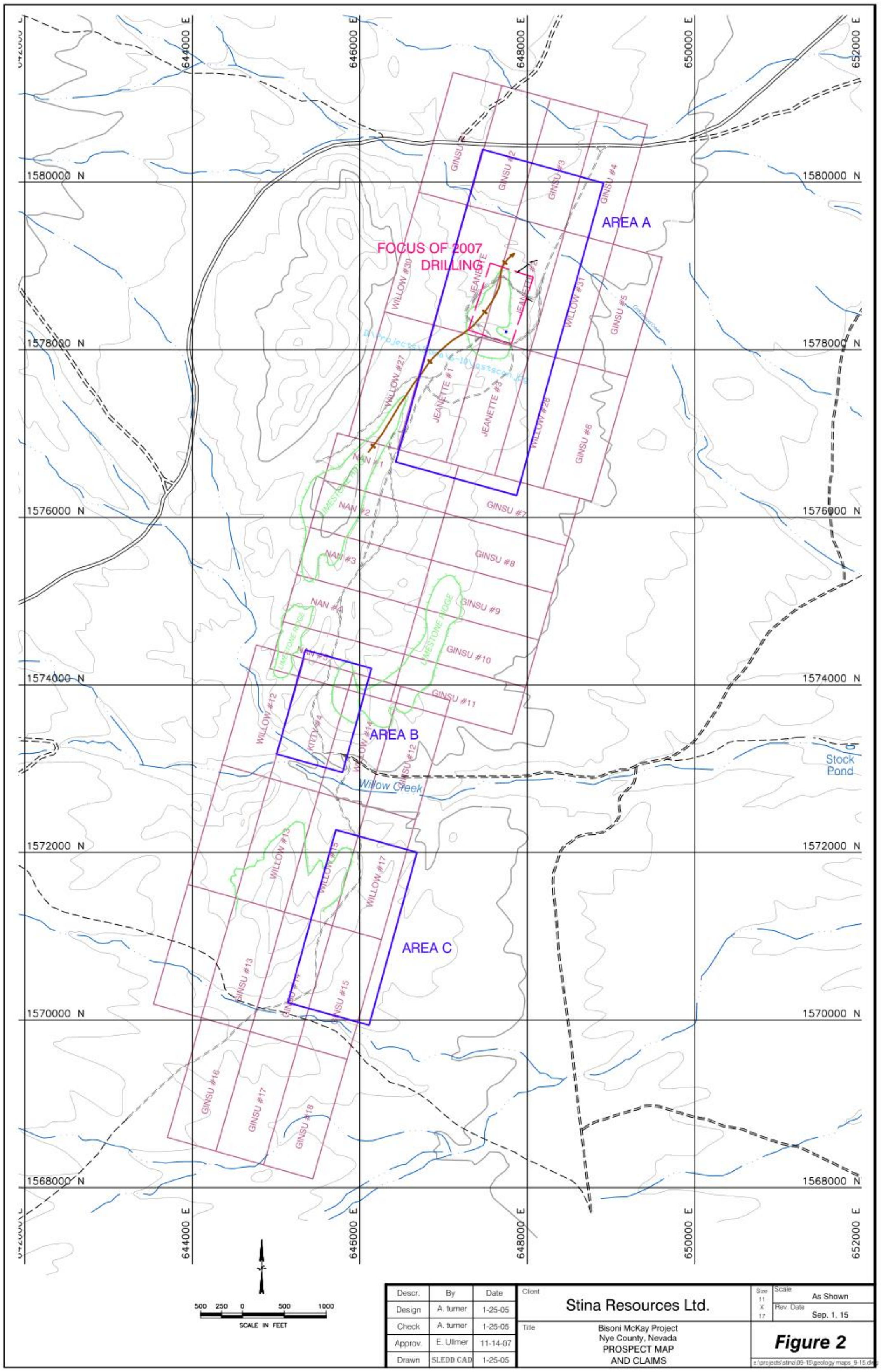


FIGURE 1B
Location Map and Exploration Areas
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
From Phase II Technical Report (Amended)
January 2008, Author Ed Ulmer


644000 E
646000 E
648000 E
650000 E
652000 E
1580000 N
1578000 N
1576000 N
1574000 N
1572000 N
1570000 N
1568000 N
AREA A
AREA B
AREA C
FOCUS OF 2007 DRILLING
Willow Creek
Stock Pond
SCALE IN FEET
500 250 0 500 1000
Descr. By Date
Design A. turner 1-25-05
Check A. turner 1-25-05
Approv. E. Ullmer 11-14-07
Drawn SLEDD CAD 1-25-05
Client
Stina Resources Ltd.
Title
Bisoni McKay Project
Nye County, Nevada
PROSPECT MAP
AND CLAIMS
Scale As Shown
Rev. Date Sep. 1, 15
Figure 2

ITEM 5 - ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

To summarize this section from the 2006 and 2008 technical reports, the Bisoni McKay (BMK) property can be accessed from Eureka via US Highway 50 by driving south-east about 12 miles, then turning south on State Route 379 toward Duckwater. About 8 miles south of Highway 379, use the right (west) fork and continue southwestward along Russell Ranch road for about 20 miles, passing the Gibellini and the Bisoni vanadium properties in the nearby hills west of the road. (The prospects are not visible from the road.) This road is a well used, maintained dirt road for ranch traffic. Approximately 20 miles south of the fork, the road curves west and a sign to the Bisoni McKay property will indicate a left turn onto an unmaintained 4-wheel drive track that goes southward directly onto the Bisoni McKay claim block (see Figures 1B and 2). The system of poor to fair unimproved roads on the BMK property extends southward for two miles on the BMK claim block. The claim block ends at an unnamed east-draining creek (called Dry Creek on some maps) about 0.5 miles south of Willow Creek. The total distance from Eureka to the BMK property is about 40 miles.

The town of Eureka and surrounding area is capable of providing experienced people and many of the services and supplies needed to support a small mine operation. There are a number of active precious metal operations near Eureka in Eureka County and adjacent counties. Carlin and Elko, NV, larger towns along Interstate I-80 are about 160 miles due north of the property. The area is very sparsely populated. The USGS Snowball Ranch Quadrangle, 7.5 minute topography map covers all the BMK property holdings and road access.

The arid climate is typical of the high desert of the Basin and Range Province in Nevada. Summer temperatures range from 75^0 to 85^0 Fahrenheit (F). The annual precipitation is 12.64 inches; the annual snow fall is 66,25 inches. Evaporation is about 50 inches a year. There is a weather station at the Eureka Airport (elevation 6,450 feet AMSL) to check local weather conditions. The elevations within the small exposure of the Fish Creek Range on the BMK claim block varies from 6,800 to 7,100 feet AMSL The more rugged topography occurs along a narrow strip on the laim block that is typically less than 1,500 feet wide, . Some drill sites need short access roads and site preparation here. The drilling in Area A is in this area. Much of the drilling outside the more hilly topography can proceed with only a minimal of access and site preparation or none at all..

The operating season for drilling in Nevada may continue throughout much of the year, but often working on the more remote sites may have to be discontinued during the winter months. Blizzards and ice can hamper daily access to the property making scheduling difficult.

Drilling water may be available accessed from a local rancher a few miles from the site, or from a more distant rancher about 15-20 miles to the north. A potential groundwater supply for a Bisoni McKay mine operation could come from a well(s) in nearby Tertiary aquifers within in the Little Smokey Valley alluvial fill that begins directly east of the BMK. This broad valley drainage extends north for many miles; the valley is a deep late Tertiary Basin and Range, own-faulted block that has been filled with late Tertiary and Pleistocene-Recent sediments that include permeable aquifer sediments.

ITEM 6 - HISTORY

In 1942, Louis Gibellini discovered nickel-cobalt-manganese-zinc mineralization located just east of what is now the Gibellini Hill prospect, about 8 to 10 miles north of the BMK prospect. The US Bureau of Mines ("USBM") studied the mineralization in 1944 and again in 1946. In 1953 a very small mining venture there shipped out 95 tons of material (no vanadium). In 1956 Union Carbide Nuclear Corporation (UCNC) discovered vanadium at the Louie Hill deposit near the base metal workings and shortly thereafter at Gibellini Hill.

Union Carbide Nuclear Corporation (UCNC) conducted the first extensive evaluation of the area including the Bisoni and Bisoni McKay Properties in 1958 and 1959 (Roberts et al, 1967, Davis & Ashizawa, 1959, Davidson & Lakin 1961a, 1961b, Hausen, 1960). Results of UCNC's drilling are shown in Table 2.

Table 2
Union Carbide Nuclear Corporation

Drilling Results 1958-1959		
Hole	**Depth (ft)**	**V_2O_5 (%)**
1	100	0.34
3	195	0.55
8	280	0.38
9	250	0.43
11	240	0.4
12	200	0.38
13	280	0.32
Average		0.4

Several major mining companies subsequently explored and undertook geologic and metallurgical investigations on the mineralization at BMK and Gibellini. These companies included Kerr McGee Oil, Transworld Resources, Atlas Minerals, Hecla Mining, and Noranda. In the early seventies, Noranda carried out a program of metallurgical research on vanadium recovery from carboniferous shale at the Colorado School of Mines Research Institute ("CSMRI"). In 1974, on the basis of prevailing metal prices, Noranda decided that that the properties were uneconomic and withdrew their interest. The most comprehensive early exploration program at BMK was carried out by Hecla Mining Company (Hecla) in the 1970s. Extensive trenching (these trenches remain mostly open for observations and sampling and are plotted across the project area on Figure 3. Hecla also drilled nineteen reverse circulation holes during the 1970s (see Figure 3 for the Hecla hole locations project-wide). The trenches later sampled by Stina are Hecla's work. Stina's 2005 Technical Report included a discussion of the results of Hecla's drilling in Section 10, a tabulation of assay results and logs in Table 13.2, and a summary of the original logs, albeit incomplete, was included as Appendix 15.

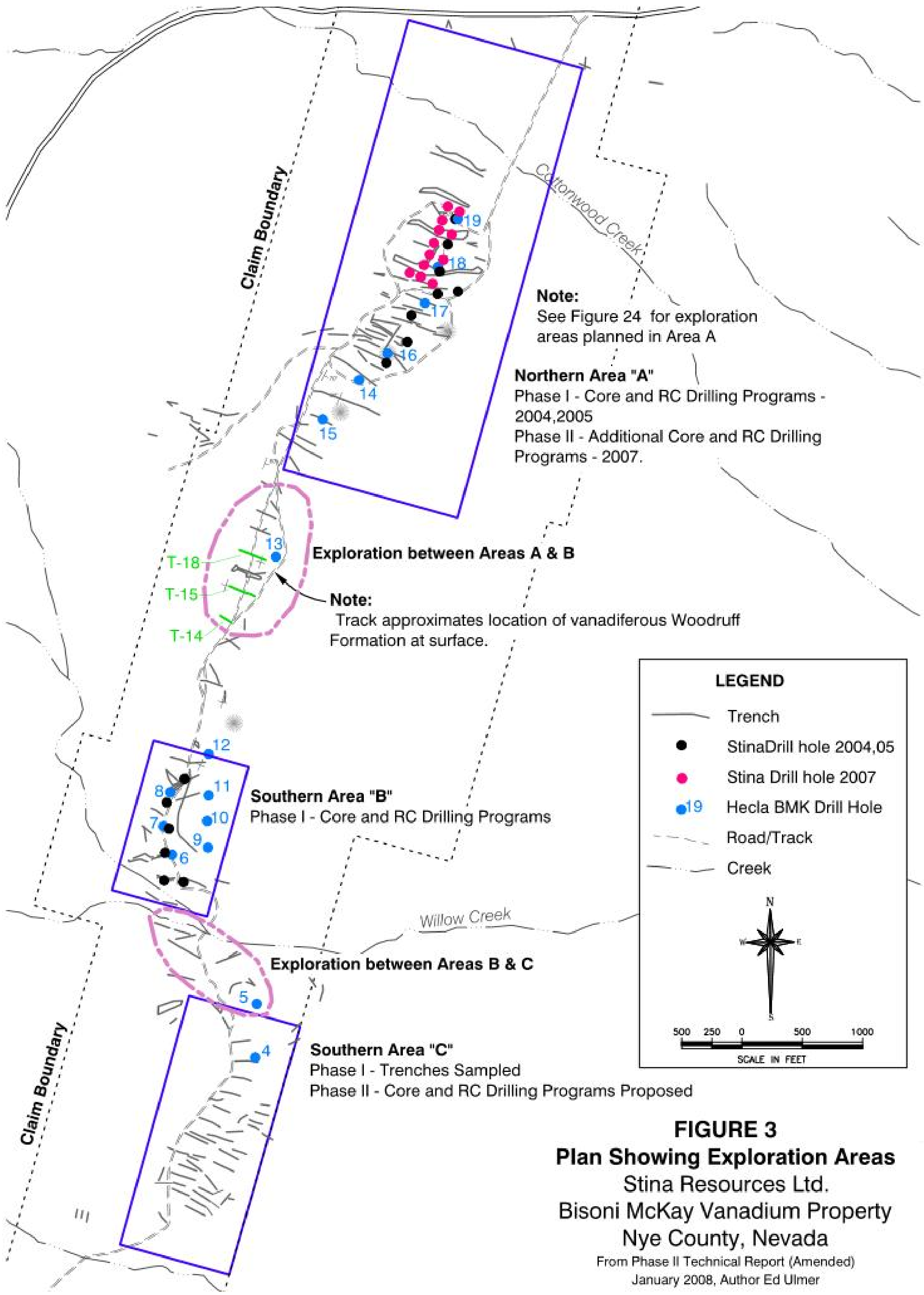


FIGURE 3
Plan Showing Exploration Areas
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
From Phase II Technical Report (Amended)
January 2008, Author Ed Ulmer

Exploration and Ownership 1980s and 1990s: TRV Minerals and Inter-Globe Resources optioned the properties in 1981 and conducted bulk sampling for heap leach testing of the vanadium mineralization at BC Research. Subsequently, the three properties were returned to the original owners. In 1993, the claims covering the Bisoni McKay Property lapsed and were then restaked by VIC. Apart from the claims controlled by VIC, the Gibellini heirs continue to control claims over the nearby Gibellini and Bisoni properties.

Prior Estimates of "Mineral Inventories": All estimates of "resources" and/or "reserves", from past exploration do not satisfy the requirements of Canadian National Instrument 43-10 1 or the U.S. Securities and Exchange Commission ("SEC"). They are dated and without backup data and, as such, cannot be relied upon for a current resource estimate. The location of Hecla drill holes that are known are plotted on maps for Figures 3, 4, 5, and 6. Figures 3, 4 and 6 include the area drilled by Stina in 2007.

Table 3

Hecla 1970s Historic Vanadium Inventory Estimate

Bisoni McKay Property

Number of Drill Holes	Mineral Inventory (st)	V_2O_5 %	V_2O_5 Resource Estimate in lbs
19	**6,100,000 tons**	**0.39%**	**4.758 x 10^6**

Hecla's mineral inventory reported for the Bisoni McKay deposit came from a reported Hecla estimate in the 1970s from its 19 reverse circulation (RC) drill holes (See Table 3 above and Figure 3 for Hecla hole locations. The grades were derived from drill cutting samples. The parameters and estimating method used in Hecla's estimate are not known such as strike length(s), widths of mineralization, dilution, cut-off grade(s), rock densities, mineralization continuity, compositing procedures, etc. The distances between most of the 19 holes are too great and the total tonnage too small to infer mineralization continuity from hole to hole throughout the project drilled by Hecla, but the average Hecla V_2O_5 grades compares well with Stina's typical grade range from the nearby 2005 and 2007 drill samples, and the stratigraphy comparisons are favorable.

The category of Hecla's historical estimate is not available, and the estimate is not considered that of a Mineral Reserve or Resource within the context of Canadian National Instrument 43-101. The estimate is not presented here as a mineral resource, but it is appropriate to take the drilling data and the grade estimate into consideration when determining the potential of exploration targets for Stina's exploration plans.

ITEM 7 - GEOLOGICAL SETTING & MINERALIZATION

Item 7.1 Regional Geology

The north-trending Antelope, Diamond and Fish Creek Ranges of southeast Eureka County and northwest Nye County are underlain primarily by Paleozoic sedimentary rocks of Ordovician, Silurian and Devonian age (Roberts et al, 1967; Hose, 1983). The Bisoni McKay Vanadium Property is located along the southeast end of the exposure of the Fish Creek Range. These early Paleozoic sediments were deposited in a broad geosyncline that covered most of Nevada. In this sequence of rocks there are two broad lithofacies: an eastern carbonate facies and a western siliceous/volcanic assemblage. During the Antler Orogeny, which extended from the upper Devonian to the lower Pennsylvanian Periods, these sediments were folded and the western siliceous assemblage was thrust over the eastern assemblage along the Roberts Mountain Thrust trend. The Roberts Mountain Thrust and portions of the upper thrust plate are mapped in the southern Fish Creek Range west of the Bisoni McKay Project. Subsequently, a syn to post-orogenic assemblage of clastic and minor carbonate sediments were deposited east of the orogenic highlands during the Mississippian to Permian Periods. The Woodruff Fm shale that hosts the vanadium is one of the units that are part of the deformation due to thrusting and other fault epicodes.

The host rocks for the Bisoni McKay vanadium mineralization belong to the Gibellini facies of the Woodruff Formation, an upper Devonian sequence of fine-grained mudstone, siltstone and very fine sandy siltstone (called shale in this report for convenience) that fall into the general rock category of shale or mudstone. Carbonates appear to be infrequent in the vanadium-bearing assemblage. The Woodruff sediments are reported to have been deposited just before or during the beginning phase of the Antler orogeny and associated thrusting and related deformation in the Devonian and Mississippian Periods. The geology discussion in the USGS Cockalorum Wash Quadrangle (Hose, 1983) places the Woodruff Formation rocks within the lower plate assemblage of the Roberts Mountain Thrust geometry. In contrast with Hose (1983), others suggest that the clastic sediments at the Gibellini vanadium prospect, located several miles north of the BMK property may indicate that the Woodruff may be part of the upper plate stratigraphy (Smith and Ketner, 1968; Sandberg et al, 2003). The front of the Roberts Mountain thrust zone is now thought to be several miles west of BMK (B. Poole, USGS, pers com.) and the Woodruff Fm and other lithologies are olistoliths along the thrust zone . On the BMK property blocks of the Woodruff Fm have been preserved between fault blocks of earlier and later Paleozoic rocks, mostly by northward striking structural movements. Also, later left lateral fault movement has Felsic stocks with associated hydrothermal metal mineralization and Tertiary volcanics have intruded along parts of the Fish Creek Range during the Mesozoic and Tertiary, but none have been found at or near the BMK prospect. In the vicinity of the Bisoni McKay Property located on the east flank of the southern tip of the Fish Creek Range, late Tertiary volcanic and sedimentary rocks unconformably overlie the older rocks, especially in the structural basin valley east of the project. They do not, however, interfere with current exploration on the property. Quaternary alluvium partly fills the valley, and gravel deposits blanket the pediment bedrock surface on the flanks of the Range.

The three known deposits of the Central Nevada Vanadium Belt all occur in the Woodruff Formation within the subunit known as the Gibellini facies in which carbonaceous sediments are abundant. The Woodruff Formation overlies middle Devonian limestone and extends as scattered fault block outcrops in the Fish Creek Range from the town of Eureka southward for over 50 miles. At the Bisoni McKay project the prominent Devonian carbonate unit on and near the property has been identified as the middle Devonian Devils Gate Limestone (Note-the lower member of the Devils Gate is now known as the Denay Limestone which has been formerly identified as the middle-upper Devils Gate Limestone on most mapping and earlier publications prior to 2008 (F.G. Poole, USGS, pers com.). The contemporary or slightly younger Woodruff shale/mudstone is interlayered with bedded chert and calcareous shale and minor limestone along much of its exposure length, and, therefore, it is considered a transitional-western lithology between eastern (miogeosynclinal carbonate facies) and western assemblages (eugeosynclinal clastic facies). Near the Bisoni McKay Property, the exposed Woodruff rocks are composed of carbonaceous shale, mudstone, siltstone and minor limey shale and sandstone. In the vicinity of the project area another subunit, the Bisoni facies, a gray dolomitic or argillaceous mudstone and siltstone with less carbonaceous material is reported to underlie the Gibellini facies. An organic-rich phase of the Woodruff has been described near the top of the Woodruff in the Pinon Range, about 100 miles north of BMK.

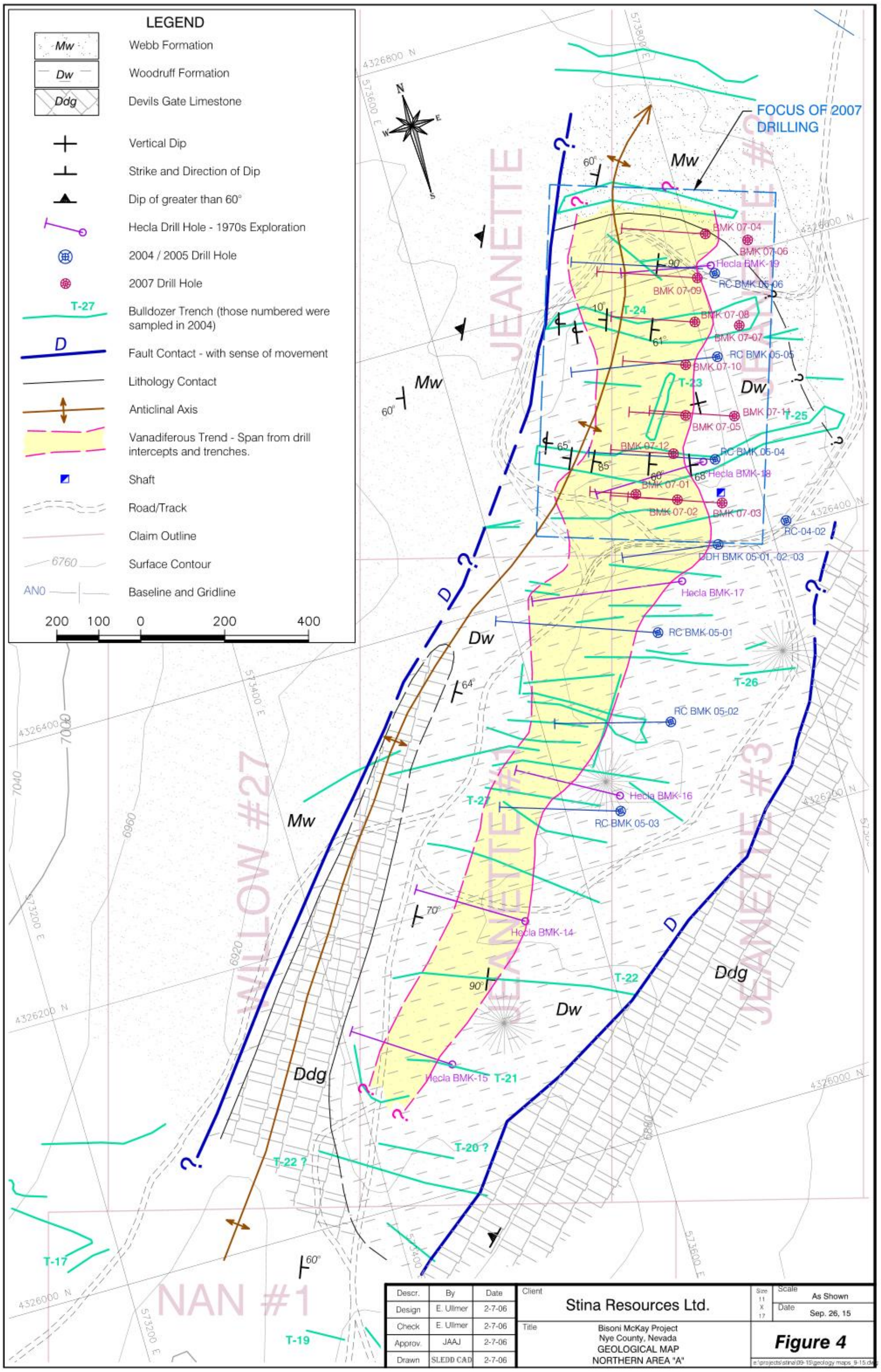
The Fish Creek Range is structurally complex with a tangled web of bulges and basins that effected local sedimentation and complicated the stratigraphic continuity. Also there is a large scale impact ring feature that had a regional deformation effect, and the regional structures such as the Roberts Mountain thrust produced during the late Devonian-early Mississippian Antler Orogeny. Later Tertiary extensional tectonics produced the Basin and Range faulting and possibly earlier faulting that has preserved parts of the Woodruff Formation sequence, including the Gibellini facies, within north-south trending fault blocks (grabens) or hinge fault blocks that are commonly bounded by older massive Devils Gate carbonate sediments in the BMK property.

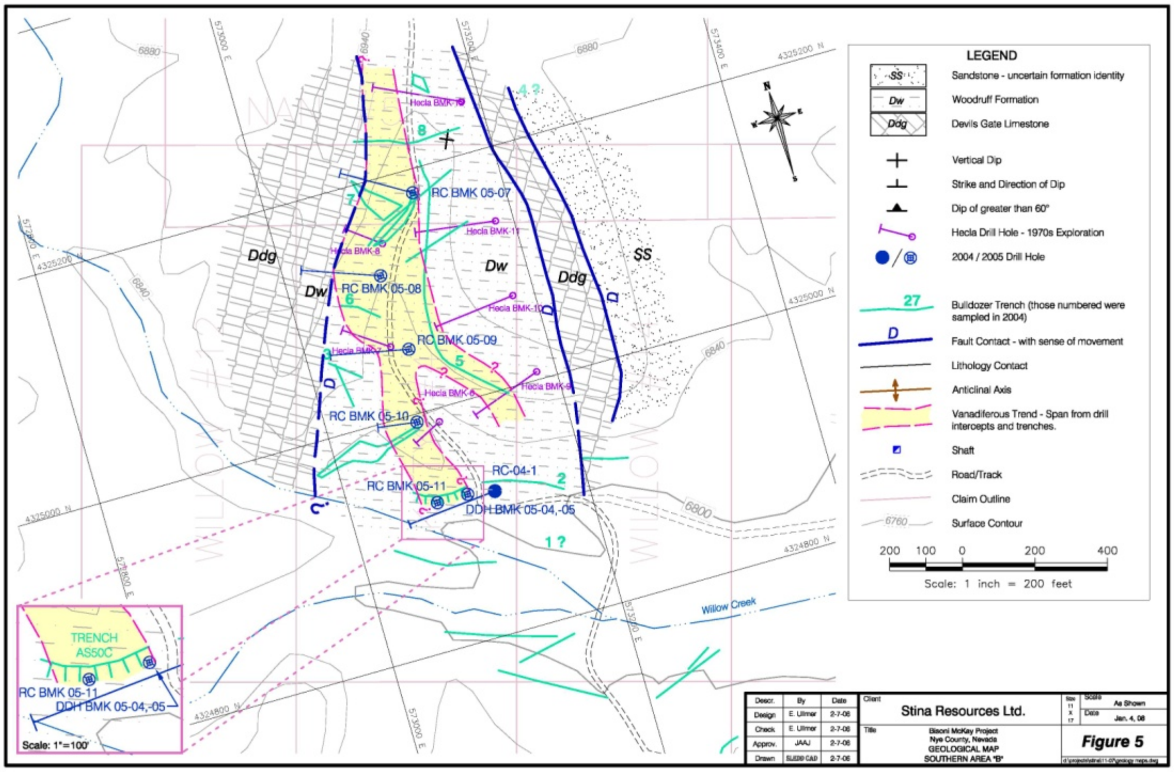
Item 7.2 Local Geology

Before proceeding with a discussion of the local Bisoni McKay geology it, should be noted that the USGS is close to completing a revised, detailed geologic map and study of the Paleozoic to Tertiary/Quaternary rocks and the structural geology in the vicinity of the BMK claim block. The new findings cannot be discussed here before the information is published. The older, more regional USGS geology map that included the BMK rocks was published by Hose, 1983). The overall geologic interpretation of this Technical Report and the earlier BMK technical reports are largely based on the Hose, 1983 interpretation of the Bisoni McKay area. The new Poole and Sandberg map is due to be in print soon and will open up some fresh ideas on the local BMK geology and structure by building up a revised interpretation from the more recent picture of the Nevada's Paleozoic structural history in east central Nevada (See Poole and Sandberg 2015). Author Forest Poole has been involved with the BMK area since the 1980s because of his interest in metal deposits (i.e.: vanadium) in Paleozoic carbonaceous sediments in Nevada, Montana and elsewhere.

As of now the Woodruff and underlying Devils Gate Limestone contact relationship on the project is mapped as a fault, perhaps part of which may be a slide block plane. In any case, at first glance both formations appear to be folded in sequence. Prior to Tertiary faulting the Devils Gate Limestone, the overlying Woodruff Formation and perhaps the Mississippian strata above, tentatively identified as the basal unit of the Webb Fm, appear to have been folded as a unit as exemplified by the north-trending fold and an accompanying fault that extends along the west side of the drill grid in Area A North. The fold may be due to drag along the north-south west fault trend. The new USGS map will improve the practical interpretation of the geology and will likely modify some of the future exploration drilling strategies at BMK.

The local BMK geology, as currently understood until now, is shown on Figure 4 for Area A North and Figure 5 for the southern area or Area B, respectively (see Figures 2 and 3 for area locations). In the project area the late Devonian Gibellini facies and the greater Woodruff Formation are typically preserved and exposed in down-dropped fault blocks. The vanadiferous beds are mapped across the area drilled in 2004/2005 and 2007 as shown on the above maps. In the vicinity of the drill targets the Woodruff Formation is juxtaposed with the older, massive outcrops of Devonian Devils Gate Limestone on the east and west of Area A-South. The north to northwest concealed fault has juxtaposed the Devils Gate limestone against the Mississippian Webb Fm that has resulted placing the Woodruff rocks in fault contact with the younger Webb Fm, which is younger than the Woodruff.


LEGEND
Mw Webb Formation
Dw Woodruff Formation
Ddg Devils Gate Limestone
Vertical Dip
Strike and Direction of Dip
Dip of greater than 60°
Hecla Drill Hole - 1970s Exploration
2004 / 2005 Drill Hole
2007 Drill Hole
T-27 Bulldozer Trench (those numbered were sampled in 2004)
D Fault Contact - with sense of movement
Lithology Contact
Anticlinal Axis
Vanadiferous Trend - Span from drill intercepts and trenches.
Shaft
Road/Track
Claim Outline
6760 Surface Contour
AN0 Baseline and Gridline
200 100 0 200 400
FOCUS OF 2007 DRILLING
JEANETTE
WILLOW #27
NAN #1
Mw
Dw
Ddg
BMK 07-04
BMK 07-06
Hecla BMK-19
RC BMK 05-06
BMK 07-09
T-24
BMK 07-08
BMK 07-07
RC BMK 05-05
BMK 07-10
T-23
BMK 07-11
T-25
BMK 07-05
BMK 07-12
RC BMK 05-04
Hecla BMK-18
BMK 07-01
BMK 07-02
BMK 07-03
RC-04-02
DDH BMK 05-01, -02, -03
Hecla BMK-17
RC BMK 05-01
T-26
RC BMK 05-02
Hecla BMK-16
RC BMK 05-03
T-27
Hecla BMK-14
T-22
Hecla BMK-15
T-21
T-20 ?
T-22 ?
T-17
T-19
Descr. | By | Date
Design | E. Ullmer | 2-7-06
Check | E. Ullmer | 2-7-06
Approv. | JAAJ | 2-7-06
Drawn | SLEDD CAD | 2-7-06
Client
Stina Resources Ltd.
Title
Bisoni McKay Project
Nye County, Nevada
GEOLOGICAL MAP
NORTHERN AREA "A"
Scale As Shown
Date Sep. 26, 15
Figure 4



Most lithologic blocks near the project appear to be grabens or hinge blocks with the Woodruff Formation occupying a down-faulted block, but there may have been earlier structural adjustments, including folding. The dominant north-trending strikes of the numerous faults and normal fault blocks are congruent with the overall, dominant Fish Creek Range structural trend produced during the mid-late Tertiary Basin and Range tensional deformation. These faults and their less obvious local subsidiary breaks and splits will likely be important mineralization controls for exploration

At the Bisoni McKay property, the Woodruff Formation is composed of carbonaceous shale and siliceous and calcareous mudstone, siltstone and minor sandstone estimated to be at least 300 feet thick. The total thickness of the Woodruff Formation (mineralized and non-mineralized strata) is uncertain on the property because complete sections have not yet been drilled, but it appears to be greater than 400 feet. The primary vanadium deposition is syngenetic and occurs within a series of very fine grained clastic beds consisting of silt sized quartz grains, organic compounds (most likely kerogen, as is reported to be present as the organic component at the nearby Gibellini and Bisoni prospects; see "Adjacent Properties" section), minor iron oxides and pyrite. The split core of the organic shale has a fetid, oily odor. The vanadium-rich black shale beds form a tabular body of mineralized facies that follow the formation dips to undetermined depths. Typically, carbonate is only present in very minor to trace quantities mostly as $CaCO_3$ stringers except at near surface where secondary caliche deposits have formed within a few feet of the ground surface. There are scattered minor quartz veinlets, likely from the effects of diagenesis, and also a few thin felsic dikes that appear to have caused no significant alteration or effect on the mineralization. In general the mineral constituents of the shale are very fine grained and macroscopic observations are limited.

The local geology as revealed by recent drilling, surface mapping, examination of existing trenches on the property and new unpublished mapping by USGS staff appears to conflict with the 1983 interpretation of local geology interpreted on the USGS Cockalorum Wash Quadrangle (Hose, 1983). The Woodruff Formation as mapped on the Cockalorum Wash quadrangle is too limited in extent and is absent where it is currently observed by Stina's geologic work and recent, as yet unpublished mapping by the USGS geologic staff (B. Poole, pers. com.). In particular, the lower Mississippian Webb Formation and, less commonly, the Antelope Range Formation above it are mapped over the area where the Woodruff Formation and the Gibellini facies are actually found on the project area. The current interpretation by Stina staff puts the Woodruff block in fault contact with the Devils Gate limestone along much of the east side except in the northeast where the fault and the lithologies east of the fault obscured are under pediment gravels or alluvium. On the west side of the Woodruff lithology block the Woodruff is in fault contact with the older Devils Gate limestone in the southern part of Area A, and in the north it appears to be in fault contact with younger rocks, probably the Webb Fm (the scattered outcrops of sandstone and pebbly sandstone may be basal beds of the Webb). The Webb sediments are younger units that unconformably overlie the Woodruff Fm. This relationship is important for exploration for an additional vanadium resource. These younger rocks west of the fault present an opportunity to explore by deep drilling to intersect the underlying Woodruff and the vanadiferous Gibellini facies. Additional field mapping and drilling should determine if the Woodruff contact is near enough to the surface for the development of a vanadiferous facies.

The contacts between the Woodruff and Devils Gate formations are mapped as faults on USGS mapping. Many of the faults with northward strikes are likely normal Basin and Range structures, some of which could have been controlled by structure from earlier deformation. Observations from the 2005 drilling program showed that most Woodruff outcrops, trench exposures, and bedding to core angles support a preponderance of steep eastward dips Surface observations reveal that a fairly tight, asymmetric anticline strikes northward through the northern part of the claim block in Area A. Some core angles also show vertical and small overturned folds in the Woodruff shale due to local contortions. In Area A-South the Devils Gate Limestone outcrops form the core of the anticline, with the Woodruff shale flanking the east side of it, and the limestone cored fold plunges to the subsurface west of core holes DDH BMK 05-01, 02, and 03. The west side of the fold is faulted. The axis of the fold strikes to the north. (See locations of these holes and the Devils Gate Limestone outcrop on Figure 4.). In Area A North, evidence from outcrops and drill intersections suggest that the Woodruff Formation and Gibellini facies are draped over the underlying limestone that plunges beneath the surface as it nears the Area A North drill grid. Parts of both Woodruff shale fold limbs in the Woodruff can be seen Trenches 24 and 25. There is evidence in the trenches and from the 2007 drill holes that the strata on the west limb may be overturned but this has yet to be confirmed by drilling. The beds near the fold axis become strongly contorted and dips generally are steeper as the axis zone is approached and if so, may have compressed and increased the thickness of the vanadium mineralization, an added bonus for mining. The fault that appears to have offset the Woodruff Formation and the Devils Gate Limestone west of the fold axis is plotted on Figure 4. However at the north end of, directly east of the drill grid in Area A north a blanket of pediment gravel or alluvium obscures the fault (extrapolated on map) and the limestone or other rocks that are east of the fault.

In Area A the upper 150 to 180 feet of the Woodruff shale is oxidized by deep surface weathering from the chemical effects of vadose water during the Quaternary. This weathered rock is typically yellowish to orange and brown in color from iron oxide staining of the quartzose sediments and all or nearly all of the organic carbon and pyrite has been removed. The weathering process has been consistent on its effect of vanadium concentrations in the shale. In places the vanadium appears to be partially stripped, and yet other sections of shale have retained all or nearly all of the original vanadium content and may have even collected pockets of vanadium enrichments from leaching and precipitation from the shale above. The oxidized zone has suffered a net loss in a number of trace and major element constituents due to weathering/leaching including aluminum, silver, calcium, iron, nickel, sulfur, zinc, cadmium, and vanadium, among others. As expected, the bottom oxidized boundary cross-cuts the bedding.

Item 7.3 Mineralization

The significant mineralized zones encountered on the property, includes a summary of the host rocks and their chemistry and redox conditions, the nature of the mineralization, together with a description of the distribution of the mineralization.

At BMK, the vanadium mineralization within the Woodruff Formation occurs in a single thick stratigraphic package of black shale beds that are well endowed with kerogen. Vanadium is the only component of economic interest and appears to be associated with the kerogen. The shale above and below this facies appears to contain background amounts of vanadium typically less than 800 ppm and generally appears to contain less carbonaceous matter. At BMK and other nearby vanadium prospects the elevated vanadium occurs within the Gibellini facies of the Woodruff Fm. Throughout the explored parts of Areas A and B and Area C, surface chemical weathering has oxidized and stripped much of the organic material from the first 100 to 200 feet of the shale. The unoxidized carbonaceous shale below hosts the primary vanadium deposit, and it is referred to as the reduced zone. The oxidized shale is termed the oxide zone at BMK, and it similarly occurs in the nearby vanadium occurrences as discussed below. A transition zone of partially oxidized carbonaceous shale occurs between the oxide and reduced zones. The resulting redox boundary crosscuts the steeply dipping beds. The present depth of oxidation was controlled by ancient water table stands and the chemical weathering of the shale above the water table by oxygenated vadose water.

The redox boundary extends as a gently undulating, near horizontal plane from drill hole to drill hole (see sections on Figures 7 and 14 through 20 and hole locations on Figures 4 or 6). As the redox interface is approached, parts of the shale are only partially oxidized leaving some organic carbon residue; this is identified as the transition zone and is typically located as an apron directly over the redox boundary. The transition zone may be several tens of feet thick, and it was tested as a discrete mineralized type during Hazen's extraction experiments. Throughout the project area the mineralization in the oxidized zone will constitute a smaller fraction of the potential mineral resource available to be mined but typically contains economic grades overall.

The reduced zone is the primary unaltered carbonaceous shale with its organic constituents intact, and it is of principal interest for vanadium economics. The organic content is described in the

Gibellini facies as kerogen. It occurs disseminated with the siltstone matrix or occurs in local concentrations. Analyses of organic concentrations by Hazen range from 1% to 3.8% V_2O_5 for 10 samples (Baughman, 2007). Petrographic examinations and microprobe analysis of polished sections by Hazen indicate that most of the vanadium in the reduced zone appears to be associated with organics. Microprobe analysis also shows that some vanadium is also associated with iron oxides such as goethite. Petrography identifies small amounts of goethite (ferric oxide) as very fine veinlets and disseminations. The lack of a consistent V:Fe ratio indicates that there are no significant quantities of iron vanadate minerals. The association of vanadium and iron oxides suggests ultrafine mechanical mixtures. The iron oxide occurrences also carry anomalous zinc levels at uneconomic grades. The amount of iron oxide in the reduced shale is too small to account for the vanadium quantities present.

The reduced shale is dark gray to black and carries minor pyrite and marcasite, usually disseminated or as aggregates of fine grained crystals. Most of the siltstone is composed of quartz. Carbonates are a very minor constituent as very fine calcite crystals

In the oxidized zone the carbon compounds have been degraded, and vanadium occurs in secondary vanadate, phosphate, and oxide minerals. The oxidized shale is a light brown or yellow mostly due to prevailing iron oxides such as limonite, including goethite. Vanadium minerals are seldom seen macroscopically; only the more colorful secondary minerals are occasionally observed. Fine box work casts of former pyrite crystals are common. Much of the vanadium appears to be in association with iron oxides such as goethite. The supergene deposition is found within the first few feet of the reduced carboniferous sediments. The thickness of a supergene zone and its V_2O_5 grades are not consistent from one drill hole intersection to another (see Table 5 and more discussion below). During oxidation some vanadium remained in solution and was purged out of the system by groundwater flow.

In the transition zone between the oxidized and reduced sections some organics remain as disseminations, coatings, and patchy concentrations. The color is dark gray to grayish brown. The V_2O_5 grades in the organic zones typically range from 0.3% to 0.8% with a few exceeding 1.0%. Some pyrite remains and goethite often forms pseudomorphs after pyrite or is present as alteration on existing pyrite. Minor, very fine carbonate crystals occur in siltstone quartz clasts.

Within a few feet of the surface, sporadic anomalous vanadium concentrations occur in oxidized or partially oxidized, varicolored, silty shale often carrying thin veinlets of pinkish, white and gray quartz (macroscopic examination) and joint/fracture surfaces coated in limonite (goethite) and minor manganese oxide. Carbonate is typically a minor constituent in the shale except within the first few feet of the surface where Quaternary caliche deposits have formed. The assay histograms from Trenches 24 and 25, located in the area of 2007 drilling (locations on Figures 2 and 4 and histograms on Figures 21 and 22, respectively) show the grades within the zone of surface weathering when compared to assays from the angle holes beneath them. See hole RC BMK 07-07 (Figure. 15) that projects under Trench 24 and the holes extending near Trench 25 that include RC BMK 07-02 and 03 (Figure. 14), 07-12 (Figure. 15) and Hecla hole BMK-18 (Figure 11). Significant grades of vanadium remain within the deep oxidized section, but some intervals have been partially leached resulting in lower overall averages than in the reduced zone. See Table 4 for a comparison of average grade composites of the oxidized and reduced zones in most of the borings in Area A North. Note that the very low grades in the oxide zones of BMK 07-06 and BMK 07-07 are because the borings entered the 340-foot and 250-foot sections, respectively, of vanadiferous shale just above the bottom of the oxide zone. Thus the remaining portions of the oxide zone penetrated by these holes likely contain more of the native background vanadium grades or possibly the weak remnants of supergene enrichment.

In a few borings there is evidence for sporadic vanadium enrichment from supergene processes directly below the redox interface in the reduced zone. The best evidence for this occurs below the redox interface in core hole DDH BMK 05-01 where V_2O_5 grades may increase up to 1.50% for up to 35 feet below the redox horizon (Table 5). The position of the V_2O_5 grade at the redox boundary makes supergene precipitation due to leaching and redistribution a highly suspect cause. At DDH BMK 05-02, up to a 100% increase in V_2O_5 occurs for 15 feet at the redox boundary. The RC holes do not reveal as clear a pattern, but in five RC holes a 50% to 100% grade bump occurs over intervals of five to ten feet. Thus far this spotty raise in grade has yet to be examined microscopically or chemically to conclusively prove a supergene origin. At this time the possible enrichments appear only to be sweet spots for future mining and not a reliable enrichment blanket to count on. Multielement analysis suggests that some trace elements such as zinc, copper, molybdenum and cadmium have also accumulated by redeposition as thin, spotty, minor (uneconomic) concentrations up to a few tens of feet below the redox horizon.

Table 4
Comparative Average % Grades between Oxide and Reduced Zones

Zone	BMK - Stina Hole Numbers					
	07-2	**07-3**	**07-4**	**07-5**	**07-6***	**07-7***
Oxide	0.30	0.42	0.31	0.36	0.07	0.08
Reduced	0.45	0.42	0.41	0.33	0.34	0.37
	07-8	**07-9**	**07-10**	**07-11**	**07-12**	**DDH 05-1**
Oxide	0.30	0.32	0.43	0.39	0.37	0.31
Reduced	0.50	0.41	0.57	0.39	0.23	0.81

Note: Oxide grades are represented by the portion of the oxide zone that have or once had higher grade V_2O_5. A short interval of lower grades in the reduced zone indicates the boring has only penetrated a partial portion of the reduced section. * See explanation above.

Table 5 Intervals of Possible V_2O_5 Supergene Enrichment													
Hole #, Grade		Hole #, Grade		Hole #, Grade		Hole #, Grade		Hole #, Grade		Hole #, Grade		Hole #, Grade	
DDH BMK 05-1	Redox state	DDH BMK 05-2	Redox state	RC BMK 07-3	Redox state	RC BMK 07-7	Redox state	RC BMK 07-8	Redox state	RC BMK 05-1	Redox state	RC BMK 05-2	Redox state
0.63	Oxide	0.26	Oxide	0.31	Oxide	0.30	Oxide	0.41	Oxide	0.75	Oxide	0.22	Oxide
0.75	Oxide	0.23	Oxide	0.31	Oxide	0.41	Oxide	0.32	Oxide	0.32	Oxide	0.26	Oxide
0.32	Oxide	1.29	Oxide	0.21	Oxide	0.59	Oxide	0.74	Red.	0.76	Oxide	0.23	Oxide
0.76	Oxide	0.82	Red.	0.61	Red.	0.54	Red.	0.47	Red.	1.63	Red.	1.29	Oxide
1.63	Red.	1.01	Red.	1.58	Red.	0.32	Red.	0.50	Red.	1.79	Red.	0.82	Red.
1.79	Red.	0.57	Red.	0.90	Red.	0.33	Red.			1.79	Red.	1.01	Red.
1.79	Red.	0.57	Red.	0.53	Red.					0.63	Red.	0.57	Red.
0.63	Red.	0.44	Red.	0.65	Red.					1.79	Red.	0.57	Red.
1.79	Red.			0.61	Red.					0.60	Red.		
0.60	Red.									1.50	Red.		
1.50	Red.									0.60	Red.		
0.60	Red.									0.57	Red.		
0.57	Red.												

Notes for Table 5: Grades include 10 to 15 feet of background V_2O_5 values above and below the elevated "supergene" zone. "Red." = reduced zone/carbonaceous shale. Grade is in %. Enriched samples are underlined. Each sample represents a five-foot interval.

The author has observed several photo-images in the Hazen 2007 report of the carbonaceous zone showing rims or coatings composed of iron and vanadium on siltstone grains that run from 30% to over 70% V_2O_5. On images of the transition and oxide zones these coatings are largely absent. Possibly the chemical weathering processes that produced the overall oxidized state and the redistribution of iron may have removed these iron coatings by leaching and, as well, stripped some of the vanadium and redistributed some of it resulting in locally enhanced grades. A consequence of vanadium leaching often results in spotty grade clustering of the remaining mineralization. Drill hole assays show some sections in the oxide zone where vanadium is nearly absent (stripped) and other sections where grades are elevated and are even higher than typical grades in the underlying primary carbonaceous zone. Lateral continuity of economic vanadium concentration is more erratic in the oxide zone in contrast with the more typically dependable continuity in the reduced zone where vanadium remains in situ.

Stina's general stratographic studies reveal that organic material in the carbonaceous and transition zones occurs in local concentrations or is finely disseminated throughout the siltstone matrix. The organics of the transition zone ranged from 0.3%-0.8%, and in the carbonaceous zone ranged from 1.0%-1.38%. All the organics show low levels of sulfur. Even though the vanadium levels are much lower within carbonaceous material than with iron oxides (at microprobe analyses spot levels), the much more abundant presence of organics suggests that the carbonaceous material holds the major concentration of vanadium in the reduced zone. The greater spread of vanadium throughout the abundant organics will typically yield higher, more dependable grades than the vanadium in the oxide zone. The carbonaceous zone sample also reveals minute particles of elemental selenium and selenium-cadmium sulfide in association with organics.

Historic studies by Noranda in 1975 assumed that the main metallic mineral controlling vanadium in the shale at the nearby Bisoni and Gibellini prospects may be manganese oxide in nodular form; the nodules contain barium and vanadium. The vanadium content of the nodules is about 5%. Fine dusky disseminations and platy masses of hematite are ubiquitous in the shale. This manganese association with V_2O_5 does not fit at BMK. The Hazen microprobe examination and multi-element analyses indicate vanadium has no significant positive correlation of manganese with vanadium. In fact, typical manganese levels remain relatively low (less than a few tens or hundreds of parts per million (ppm)). Also, V_20_5 greater than 0.2% in reduced strata is more likely to be associated with inverse levels of manganese (at trace levels); manganese is typically an order of magnitude less when V_2O_5 is above 0.1% and sometimes rises when associated with V2O5 at background levels (below 1000 ppm).

Further aspects of the mineralization are reviewed in the Mineral Processing and Metallurgical Testing section and in the “Drilling” section.

ITEM 8 - DEPOSIT TYPES

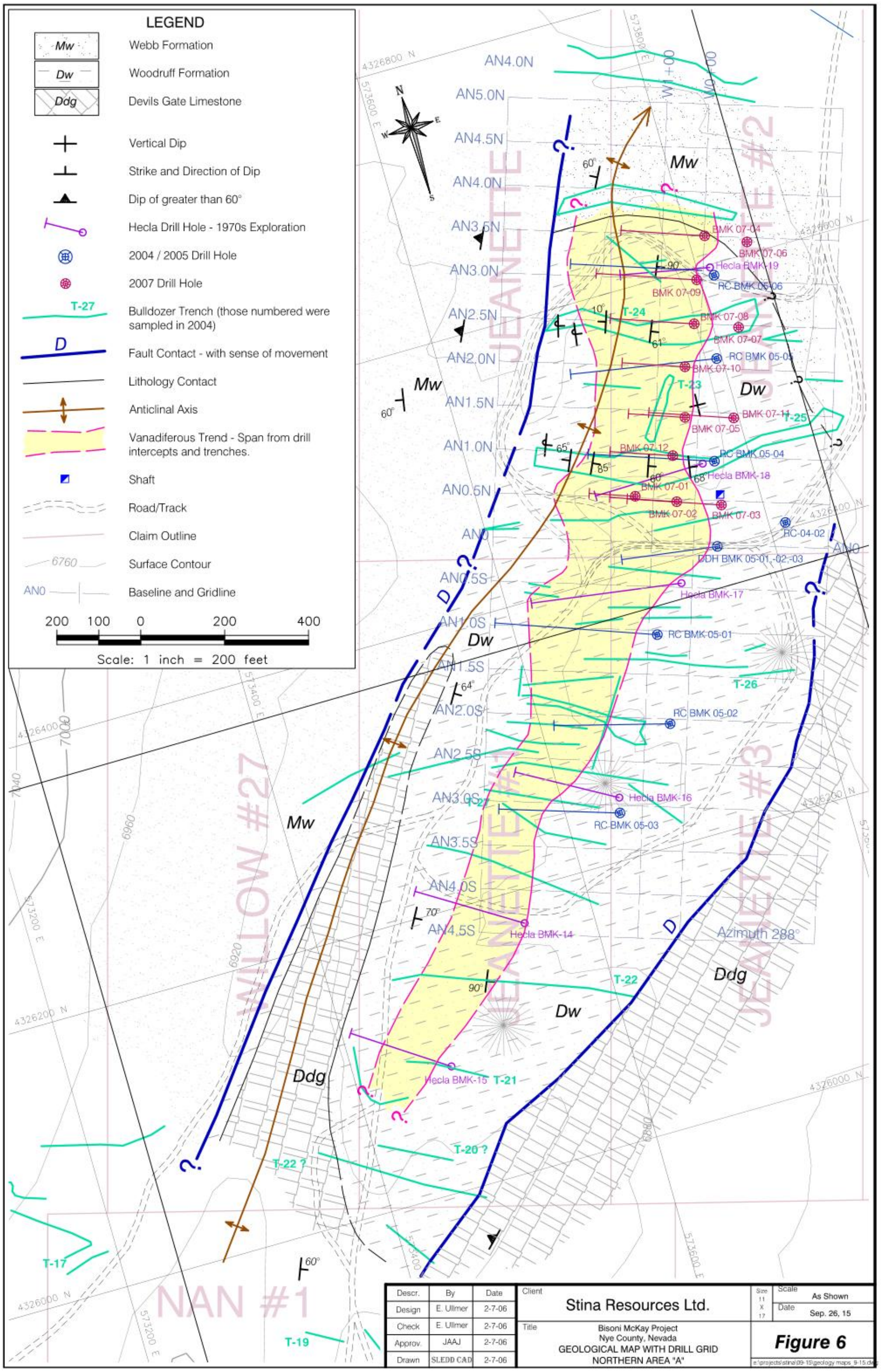
The Bisoni-Mckay vanadium deposit and the Gibellini facies fit within a class of syngenetic, stratabound and strataform carbonaceous shale deposits occurring worldwide that often contain anomalous syngenetic accumulations of metals such as vanadium, zinc, uranium, copper, barium, chromium, lead, molybdenum, silver, nickel, cadmium, selenium, sulfide, and phosphate. Most quantities of these elements in the carbonaceous shale/mudstone sequences at BMK remain well below economic interest, but many commonly occur as weak to moderate anomalies. When these sediments are altered by weathering the carbon and metals may be leached. However some of the original rock-forming constituents elements may remain except for changes in their mineralogical affiliations and loss of some of the volatile constituents. A weathered zone may be partially or totally stripped of metal, or the metals can be redeposited under certain conditions as supergene deposits Anomalous vanadium in carbonaceous rocks worldwide is often reported to be associated with the kerogen fraction. Another common control for vanadium in these sediments is the presence of iron as iron oxides after oxidation. In contrast to BMK, the weathered or oxidized rocks at the Gibellini Hill vanadium deposit, located in the same basic stratigraphic unit as BMK, contains more anomalous populations of other metals that are typical to many black shales worldwide.

Adsorption and precipitation under optimum environmental conditions must have been important in precipitating these constituents from sea water; most of the anomalous organic shale deposits are marine. Some organic shale deposits contain multiple metals with elevated sub economic to economic quantities; others such as the Bisoni McKay contain very few anomalous metals. The majority of organic shale deposits have no economically viable metal anomalies. The metals in organic shale appear to have had little direct association or genetic affiliation with volcanism or hydrothermal processes. Much of the organic content is described as kerogen, and some shale bodies have been examined for hydrocarbon resources. As far as known, anomalous organic or graphitic shale lithologies occur in every geologic era from the Precambrian to the Tertiary.

At Bisoni McKay the core holes provide evidence that the vanadium mineralization is syngenetic and has stratabound and strataform characteristics. So far as determined, the primary stratigraphic control of mineralization in the reduced zone is the presence of organic material in the shale. At this time vanadium grade variations due to primary depositional factors have not been studied in detail at BMK.

ITEM 9 - EXPLORATION

This section includes the Phase I work discussed in the previous 2006 Technical Report and the new Phase II field work conducted in 2007. The Phase II program is completed with this Technical Report. There has been no additional field exploration carried out on the property since the last drilling program in 2007 and the drill hole survey in June 2010 as discussed in this report. The more recent efforts have been devoted to metallurgical studies and routine maintenance. Following the 2005 drilling, the 2007 program emphasized additional drilling in the north half of Area A to detail a proposed resource test site.


LEGEND
Mw Webb Formation
Dw Woodruff Formation
Ddg Devils Gate Limestone
Vertical Dip
Strike and Direction of Dip
Dip of greater than 60°
Hecla Drill Hole - 1970s Exploration
2004 / 2005 Drill Hole
2007 Drill Hole
T-27 Bulldozer Trench (those numbered were sampled in 2004)
D Fault Contact - with sense of movement
Lithology Contact
Anticlinal Axis
Vanadiferous Trend - Span from drill intercepts and trenches.
Shaft
Road/Track
Claim Outline
6760 Surface Contour
AN0 Baseline and Gridline
200 100 0 200 400
Scale: 1 inch = 200 feet
Descr. By Date
Design E. Ullmer 2-7-06
Check E. Ullmer 2-7-06
Approv. JAAJ 2-7-06
Drawn SLEDD CAD 2-7-06
Client
Stina Resources Ltd.
Title
Bisoni McKay Project
Nye County, Nevada
GEOLOGICAL MAP WITH DRILL GRID
NORTHERN AREA "A"
Scale As Shown
Date Sep. 26, 15
Figure 6
JEANETTE #1
JEANETTE #2
JEANETTE #3
WILLOW #27
NAN #1
Azimuth 288°
Hecla BMK-19
Hecla BMK-18
Hecla BMK-17
Hecla BMK-16
Hecla BMK-14
Hecla BMK-15
RC BMK 05-01
RC BMK 05-02
RC BMK 05-03
RC BMK 05-04
RC BMK 05-05
RC BMK 05-06
RC-04-02
DDH BMK 05-01,-02,-03
BMK 07-01
BMK 07-02
BMK 07-03
BMK 07-04
BMK 07-05
BMK 07-06
BMK 07-07
BMK 07-08
BMK 07-09
BMK 07-10
BMK 07-11
BMK 07-12
T-17
T-19
T-20 ?
T-21
T-22
T-22 ?
T-23
T-24
T-25
T-26

Item 9.1 Summary of Phase I Exploration – 2005

The Woodruff Formation and the accompanying carbonaceous sequence of shale and mudstone of the Gibellini facies host the vanadium concentrations. The Woodruff Fm strata has been broken and slivered into dipping elongate wedges of shale packages from typically steep, fault offsets that are often subparallel to the strike of the beds as shown by the geology on Figure 4 and Figure 5. There are a couple of younger strike slip, cross faults on the BMK property that found along the Cottonwood Creek, Willow Creek, and Dry Creek; they strike roughly east-west and laterally offset the Paleozoic strata. The longer faults that are that are roughly parallel to the north-northeast trend of the Fish Creek Range have created a number of elongate fault blocks that offset the Woodruff Fm and other Paleozoic strata. Observations thus far show the potentially productive shale beds are mostly separated by uplifted limestone and barren fine clastic sediments. The interpretation of fit and mix of these fault blocks and lithologies will be reappraised from the new mapping.

In Area A and Area B, two of the anomalous carbonaceous shale trends preserved in fault blocks and separated from one another by older rocks were selected for exploration in further detail on 2005. Because of expediency, Stina has not begun a drilling program in Area C, the most southern region of the Stina's property holdings, but historic Hecla trenches and drill holes reveal that the vanadiferous, carbonaceous shale facies extends through this area also.

The stratabound and strataform vanadium mineralization is hosted by the sequence of carbonaceous shale or oxidized former carbonaceous shale/mudstone of the Gibellini facies. The strike of the shale is north-northeast, and from 2006 mapping and drill hole correlations, most dips range from 60^{o} to 80^{o}. To maximize the intersection of the beds by drilling on Area A, all but one of the eleven of the 2005 RC holes were declined at 45^{o} and oriented west-northwest to cut bedding as close as possible to normal. The two groups of three and two core holes in Areas A and B, respectively, were also declined westward but at varying inclinations to provide a comprehensive cross section of the strata. The three 2005 RC drill hole locations in Area A-north were planned along the 018^{o} W0-00 line (Figure 6) at approximately 220-foot spacings. But some planned drill sites had to be shifted in the field to accommodate steep hill slopes and previous trenching obstacles. The irregular pattern of holes along W0-00 is the result of these changes.

The areas where drilling was conducted from September to November 2005, specifically Areas A and Area B are shown on Figure 3. Geology and drill hole locations for Area A and Area B are shown in greater detail on Figures 4 and 5, respectively. Figure 4 also includes the 2007 RC borings BMK 07-01 to BMK 07-12. Exploration results are discussed in greater detail in the "Drilling" section. An exploration grid (Figure 6) was located by field methods over the north area to plan exploration holes, and the base lines and grid lines will be referred to below.

Trenches and Dump Samples
See the April 16, 2006 and 2005 Technical Reports for the selected trench work conducted by Stina in 2004-2005.

Drilling – see Item 10

Item 9.2 Summary of 2007 Phase II Exploration

In this initial stage of Phase II program, the exploration effort concentrated in Area A North (Figures 2, 4, and 24). The drilling was conducted from mid-April to mid-May 2007. The detailed RC drilling in this relatively small block of mineralization of the vanadiferous shale belt provides evidence of grade continuity both laterally and down dip. This allows sufficient data for an estimate of indicated resources for this mineralized block of shale in compliance with Canadian National Instrument 43-101. The drilling was planned along the two parallel north-trending base lines W0+00 and W1+00 at azimuth 018°. Lines were set 110 feet apart with most drill collars spaced about 110 feet (± 32 m) apart near grid and base line intersections (Figure 6). The 2007 holes were sited along W1+00 and between the 2005 holes located on W0+00. The planned positions of a few 2007 drill sites also had to be revised in the field because of terrain obstacles. The drill holes of concern are plotted on the Figures 4 and 6 maps. The lines of holes cover approximately 700 feet of strike length of the vanadium trend and provide data from up to 600 feet deep. Eight RC holes were declined at 45° at azimuth 288°; two holes were declined in the same direction at 65°, and the remaining two holes were vertical. The data from three 2005 core holes, DDH BMK 05-01, 02 and 03, located on base line W0+00, are also included in the resource assessment for Area A North. Also included in the 2007 study are three RC holes completed in November 2005, BMK-05-04, BMK-05-05, and BMK-05-06. The 18 Stina borings drilled to assess of Area A will define an indicated resource for the drilled portion of Area A North. Based on the good continuity of vanadium mineralization in Area A North and a sufficient understanding of the structural setting, an inferred resource will also be calculated for the results of the 2005 RC holes BMK 05-01, BMK 05-02, and BMK 05-03, located in Area A-South (Figure 4). Hecla's 1970s holes are also plotted on the map, but they are historical and the data will only be used for geological support and not as resource data. The Hecla geology and geochemical results support Stina's drill hole data. See the "Drilling" section below for more discussion of Stina's drilling results.

Reverse Circulation Drilling

Twelve (12) 5.75-inch diameter RC holes were completed from April 12 to May 13, 2007. All the borings were located from the premeasured grid in Area A North (Figure 6), and holes ranged from 220 feet to 645 feet in length. Drill footage totaled 4,940 feet. The holes were drilled by O'Keefe Drilling Co. of Butte, Mt using a truck-mounted Rich 650 WS rig.

Item 9.3 Final Phase II Field Work, October 2015

Several years have passed since the last period of significant field work at BMK-Area A in 2007. Consequently the final part of Phase II field work included a survey control review of Stina's 2005-2007 Area A drill holes locations in October, 2015. The 2007 drilling resulted in the V_2O_5 resource estimation calculated from the 21 bore holes located in Area A as seen in Figure 1B and reported in the previous Technical Reports (excluding drill hole RC04-02). The resource estimate was calculated in 2007 using the Vulcan program at Maptek's facility in Denver, CO. Several small horizontal and vertical location discrepancies used in these original calculations required some minor revisions in the mapped hole locations, which have now been modified on the site maps and drill hole cross sections. The revised location data was then used in 2016 to calculate a new vanadium resource estimate, again using the Vulcan program, and with inverse distance estimation in a block model array. The same assay data and core log information were used for the calculations. Drill hole RC 04-02, one of the first Stina borings drilled in 2004, also became part of the drill hole array (See Figures 4, 6 and 23B). This 295-foot vertical hole contains no V_2O_5 grades above 0.2% cutoff in either the oxidation or reduced sediments (Figure 7). The total intersection of the mineralized section in boring 04-02 appears to remain above the top of the mineralized beds. As expected, the corrected Maptek resource results did not significantly affect the indicated and inferred resource estimate to alter Stina's future exploration plans for Area A (Table 16). The recalculated reduced resource estimate (grades over 0.2% V_2O_5) increased over one million tons from the 2007 estimate.

The BMK metallurgical and mineral processing investigations will continue work on a viable, and less costly vanadium recovery system from BMK mineralization as further discussed in *Item 13*. Consequently a new metallurgical lead person was selected to continue the study of formulating a plan and perform additional bench tests to improve the efficiency and expense by working off of Hazen's efforts as wells as to investigate other, less orthodox recovery options, that are would be applicable for treatment of the dominant carbonaceous lithology hosting mineralization on the BMK deposit. The intentions of the new metallurgy program are briefly discussed below as part of Phase II. The metallurgy and mineral processing testing operations will continue in Phase III under a new budget.

ITEM 10 - DRILLING

This section has two subsections separating the 2005 Phase I drilling program and the 2007 Phase II drilling program on the BMK property. The Phase I discussion is limited to work in Area A North, which was the focus of the more detailed Phase II exploration. Much of the Phase I discussion will be essentially the same material as in the 2006 Technical Report, but it helps prepare the reader for the Phase II exploration conducted in the same area. No new exploration was conducted in the Southern Area B or in Area C since the preparation of the 2006 Technical Report. The Phase II drilling is limited to the 2007 work in Area A covered in this report. Trench sample results discussed in the April 16, 2006 Technical Report will not be repeated in this report. There have been no new developments on the trench program since the 2005 and 2006 Technical Reports.

The 2004-2005 core holes were drilled using an Atlas Copco Diamec U8 APC rig owned and operated by Kettle Drilling, Inc. of Coeur d'Alene, Idaho. With few exceptions, samples were divided into five-foot intervals, and core was split with a diamond-studded saw where necessary. The remaining half of the core is stored in core trays in a secure facility in Eureka.

The eleven Phase I 2005 RC drill holes were completed using an Ingersoll Rand Reverse Circulation (RC) drilling rig (buggy rig) with a four-inch diameter, carbide studded hammer bit, owned and operated by O'Keefe Drilling of Butte, Montana. The twelve Phase II RC drill holes completed in 2007 were drilled by O'Keefe using a truck-mounted Rich 650 WS buggy rig with a 5.75-inch bit. For each RC hole separate samples were collected at five-foot intervals. The recovered samples were each passed through a cyclone splitter set to reject about a half to two thirds of the sample and to retain the remainder. Duplicate samples of each five-foot interval were collected for metallurgical testing and labeled with sample number and a suffix “MET”.

After logging, each sample was bagged in a 10-inch x 17-inch polyester bag. Each bag was sealed with an eight-inch plastic locking tie to prevent access to the sample prior to sample preparation and chemical analysis. The samples were transported by truck either to Reno or Elko, Nevada, and were delivered to ALS Chemex laboratories under the direct supervision of the site geologist or a field assistant (Geologists Edwin Ullmer in 2005 and David Lorge in 2007). MET samples, sample rejects and pulp rejects are stored in Eureka in the same locked facility as the core trays. Core Drilling

Five (5) core holes were completed in September 2005, three (3) on grid base line AN 0 near the intersection of W0+00 in Area A (Figure 6) and two (2) on a grid line on the south side of Area B (Figure 5). Core drilling totaled 1,732 feet. The Area A core holes were oriented at azimuth 278^{o} west. The core hole total footage used for the Area A resource estimation is 1,155 feet.

Drill Log Preparation

The drill logs attached to the Phase I report were prepared from numbered sample tickets and hand written field logs. The rock material was described for five-foot intervals in each hole. As the rock types become more familiar, it became apparent that the best primary lithologic discriminators were color, grain size, hardness, and primary mineralogy with subordinate characteristics noted such as oxide minerals, veining, accessory minerals, fracturing, secondary mineral coatings on fractures and bedding planes, and nature of chip breakage. It appears that color changes result from a combination of oxidation degree and/or primary and secondary mineral characteristics. Colors were described when wet. Core angle measurements of bedding (“ca” on logs) were logged.

Reverse Circulation Drilling

Eleven (11) RC holes were completed in November 2005. Six (6) of these holes were drilled in Area A ranging from 410 feet to 550 feet in length and totaling 2,750 feet, and five (5) in Area B from 80 feet to 300 feet in length and totaling 784 feet. The Area A RC angle holes were oriented at 278^{o} west. Two RC holes were also completed in 2004 in Areas A and B, RC 04-2 and RC 04-1, respectively. The total footage of 2005 RC holes used for the Area A resource evaluation is 3,045 feet including vertical hole BMK 04-02 (Figures 4 and 6).

A down-hole survey would be carried out, especially if an angle hole. A proper lithology log would include features such the rock description, gross mineralogy, porosity estimate, alteration, stratigraphic definition, and other characteristics that would be relevant to interpret the vanadium mineralization control. Also lithologic features would be noted that could continue between holes in order to interpret a better local geologic picture of the project. These kinds of features would include bedding and bedding characteristics and mineralogy, structural elements such faulting, and evidence of local folding, and more regional faulting. Notes regarding alteration zones and an alteration boundaries would be taken. A drilling rate log would be taken by the driller that will help define areas of hard or soft lithologies that can be related to information on the drill logs.

Item 10.1 Phase I - 2005 Drilling

Calculation Parameters

The drill hole samples provided data for resource calculations carried out in 2007. Calculations and parameters used to obtain V_2O_5 values from vanadium values and other derivatives are shown in Table 6 below.

Table 6
Vanadium Pentoxide (V_2O_5)
Calculation Parameters

V atomic weight	50.95	
O atomic weight	16.00	
V_2O_5 atomic weight V O **Total**	 2 x 50.95 5 x 16.00	 101.90 80.00 **181.90**
Weight V in V_2O_5	(101.90/181.90)	0.5602%
Weight O in V_2O_5	(80.00/181.90)	0.4398%
One part per million (ppm) to %	$1x10^{-6}x10^{2}$	0.0001%
Equivalency of V in V_2O_5 Therefore 1 ppm of V in V_2O_5	181.90/101.9 1x1.7851	1.7851 1.7851 ppm V_2O_5
Tons – U.S. short tons (st)	2000 pounds (lb)	
Pounds of V_2O_5 per st	2000x% V_2O_5 $x10^{-2}$	

Area A – Drilling

Figure 6 shows the drilling grid for Area A with grid lines located at intervals of approximately 213 feet (65 meters). The grid lines are oriented on an azimuth of 288°.

2005 Core Drilling

Three (3) core holes were drilled on grid line AN 0.0., the base line for the grid. Hole Nos. DDH BMK05-0 1, DDH BMK05-02, and DDH BMK05-03 were drilled from a common collar on an azimuth of 278º at declinations of 45º, 57.5º and 63º, respectively (Figures 4 and 6). The fence of core holes with lithologies and grade composites is displayed on Figure 7.

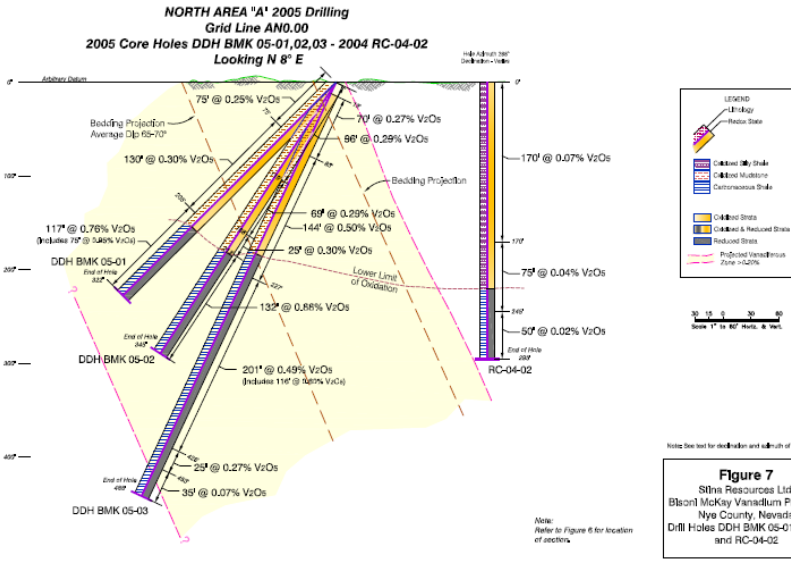


Figure 7
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes DDH BMK 05-01,02,03,
and RC-04-02

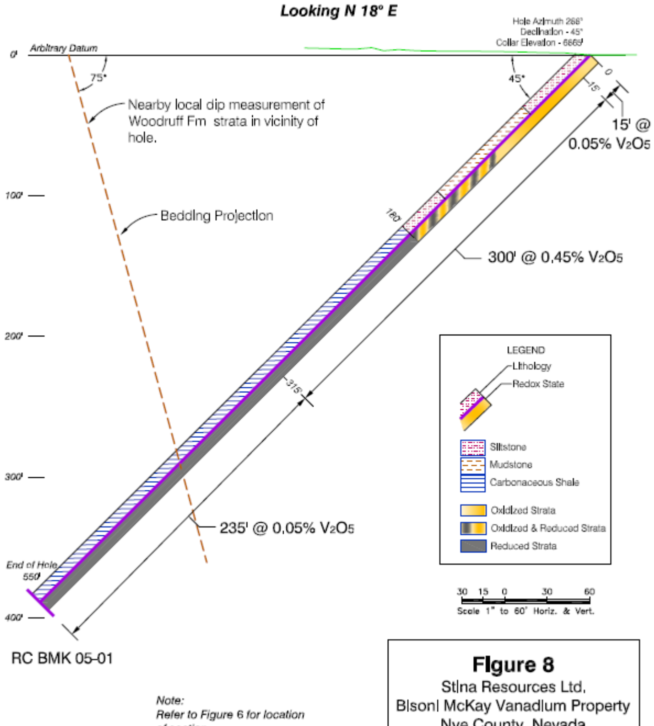


Figure 8
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Hole RC BMK 05-01

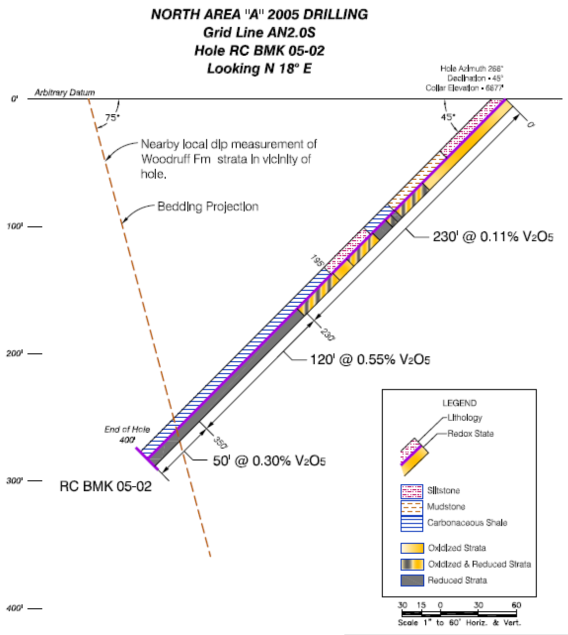


Figure 9
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Hole RC BMK 05-02

The core holes intersected strata typically dipping eastward from 60^o to 90^o (from trench outcrop dips, core angles, and correlation of mineralization limits.) and striking north-northeast in nearby trenches. The oxide zone ranged from 150 to 180 feet deep (vertical depth) in the holes, but most vanadium grades remain economically anomalous (Table 7A and Figure 7). Composite vanadium grades of 0.25% and greater begin near ground surface and continue to the total depths of DDH BMK 05-01 and 02 at 322 and 345 feet, respectively and to 428 feet in DDH BMK05-03. Holes DDH BMK 05-01 and 02 terminated while still in significant vanadium mineralization. DDH BMK 05-03 advanced 35 feet beyond 0.3% cutoff grades and into an apron of 0.2% cutoff grades, then entering into geochemically anomalous (<0.2%-0.1%) to trace mineralization in shale. Composite down-hole measurements and assay data are shown in Table 7A. These three holes give a good estimate of a minimum thickness for the vanadium enriched sequence of beds. Mineralization exceeding 0.2% V_2O_5 begins at the top of the three borings and extends to 428 feet in DDH BMK 05-03. A line from there through the end of DDH BMK 05-01 approximates a 75^o dip. Barring any subsurface dip contortions, the unit thickness at the site is about 290 feet.

Key beds or other unique lithologic characteristics are not readily discernible. The redox interface is not bedding controlled. Distinctive vanadium grades such as exceptionally high or low grades in any particular stratigraphic section do not continue as recognizable values along beds extending from core hole to core hole. It appears that grades can vary considerably along any particular bedding package but still remain significant. This is typical of RC hole correlations also.

Most core angles from bedding measurements support apparent dips ranging from 50^o to 70^o with a minority appearing to be vertical to overturned. Some of the beds are locally strongly contorted on surface exposures. Granulated zones were commonly logged in the oxidized sections. In DDH BMK 05-03, the boring that advanced through deepest section of reduced beds, there are scattered broken zones from faulting and less granulation than in the oxidized zone.

Table 7A
Bisoni McKay Vanadium Property, Area A
2005 Core Holes – Grid line AN 0.00 – Composited Grades

From (ft)	To (ft)	Downhole Interval	Approx true width	V (ppm)	V2O5 (ppm)	V2O5 (%)	V2O5 lbs/st
Hole No. DDH BMK 05-01			**AN0+0 W0+00 TD-322'**				
0	75	75		1,395	2,491	0.25	4.95
75	205	130		1,693	3,023	0.3	6.05
205	323	118		4,623	7,610	0.76	15.22
0	323	323	260'	2,563	4,575	0.46	9.15
Hole No. DDH BMK 05-02			**AN0+0 W0+00 TD-345'**				
23	119	96		1,630	2,909	0.29	5.82
119	213	94		1,635	2,919	0.29	5.84
213	345	132		4,944	8,825	0.88	17.65
23	345	322		2990	5337	0.53	10.67
Hole No. DDH BMK 05-03			**AN0+0 W0+00 TD-488'** 75° dip estimate				
13	83	70		1,501	2,680	0.27	5.36
83	227	144		2,771	4,952	0.5	9.9
227	428	201		2,761	4,929	0.49	9.86
83	428	345		2,766	4,938	0.49	9.88

2005 Reverse Circulation Drilling

Six (6) RC holes were drilled in Area A , one each on grid line AN 1.0S, AN 2.0S, AN 3.0S and AN 1.0N, AN 2.0N and AN 3.0N. The latter three holes are located in the focal area of Phase II exploration. All holes were declined at 45° on an azimuth of 278° with collar locations varied to intersect the stratigraphic section at close to 90° as possible. Collar locations are shown in plan on Figures 4 and 6 and cross sections of holes are shown on Figures 8 through 13. Historic Hecla holes are also plotted on the plan maps and in section for comparison when sufficiently near a 2005 hole. Tables 6B and 6C display the composite vanadium grades from the RC holes of Area A North.

Hole Nos. RC BMK 05-01, 02 and 03 collared on grid lines AN 1.0S, AN 2.0S, and AN 3.0S, respectively, intersected a thick vanadiferous shale section that extended down-hole covering drill intervals from 315 to 370 feet thick (Figures 8, 9 and 10; Table 7B). The general grade tenor of the stratabound mineralization continues between holes. The trend of V_2O_5 mineralization is shown in plan on Figures 4 and 6. The trend extends through the drilled interval and also projected to the south, based on trench data and interpretation from Hecla holes BMK 14 and BMK 15.

With the exception of RC BMK 05-02, each hole passed through the vanadium mineralization and into barren carbonaceous shale that visually appears similar to the mineralized zone except that organics have decreased. The stratigraphy in RC BMK 05-03 correlated well with Hecla's BMK-

16. Both terminated in limey shale that may be the beginning of a basal limey section that occurs near the Devils Gate Limestone contact. In each of the holes the grades in oxidized sections are variable indicating the effects of leaching. Significant grades in BMK-16 begin at 45 feet while significant grades in neighboring RC BMK 05-03 begin at 185 feet (Figure 10). The vanadiferous zone narrows in Hecla's holes BMK-14 and 15, located south of the 2005 holes, perhaps because drill intercepts are too high or low in the mineralized facies or arguably due to local facies changes.

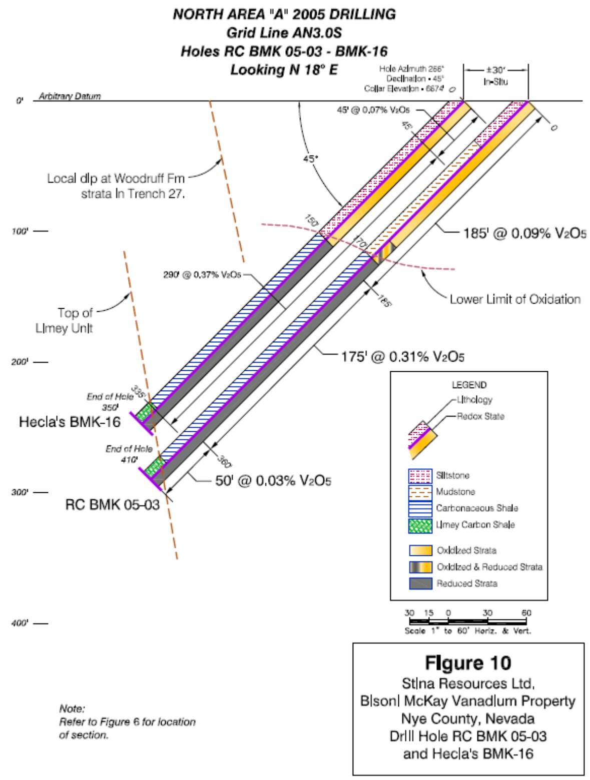


Figure 10
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Hole RC BMK 05-03
and Hecla's BMK-16

Hole Nos. RC BMK 05-04, 05-05, and 05-06 (Figures 11, 12, and 13), on grid lines AN 1.0N, AN 2.0N and AN3.0N were collared on the east flank of a low hill that is likely a manifestation of the anticline discussed in the "Geological Setting" section. The borings intersected the vanadiferous beds on the east flank of the anticline, The beds dip from 60º to 90º in nearby trenches. Significant grades extend down hole to 320, 330, and 370 feet in the three holes. Redox boundaries correlate well between nearby Hecla RC holes BMK-18 and BMK-19 with RC BMK 05-4 and 05-6, respectively (Figures 11 and 13). Significant vanadium occurs well up into the oxidized zones in all RC holes. BMK05-04 and BMK-18 may have advanced into the west flank of the anticline. See Table 7C.

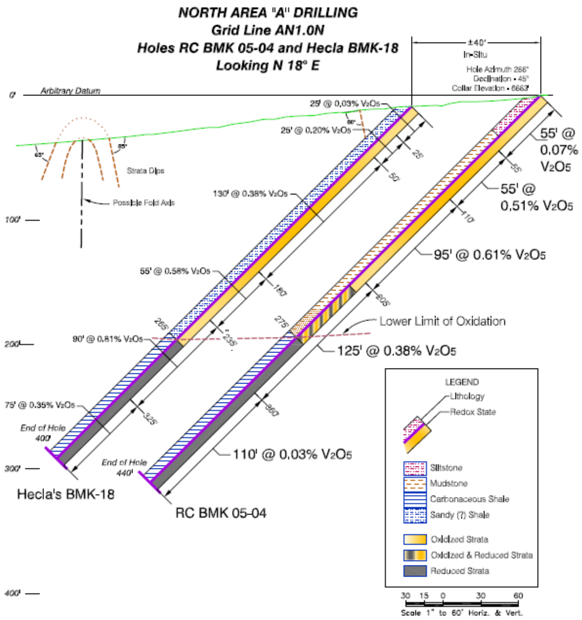


Figure 11
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Hole RC BMK 05-04
and Hecla's BMK-18

*Note:
Refer to Figure 6 for location
of section.*

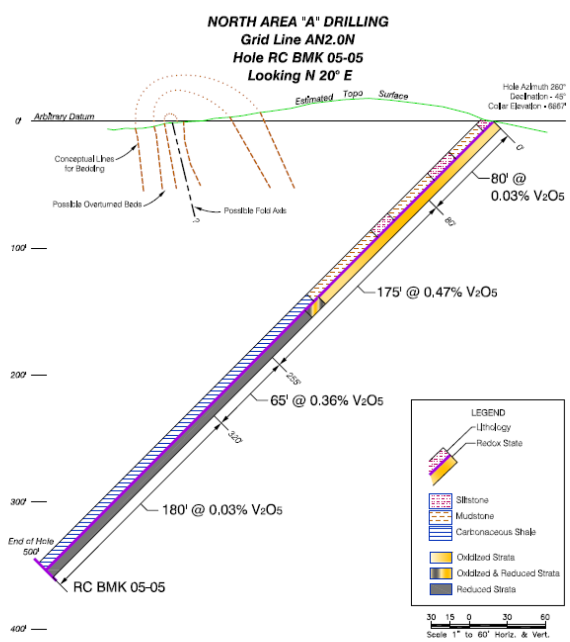


Figure 12
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Hole RC BMK 05-05

*Note:
Refer to Figure 6 for location
of section.*

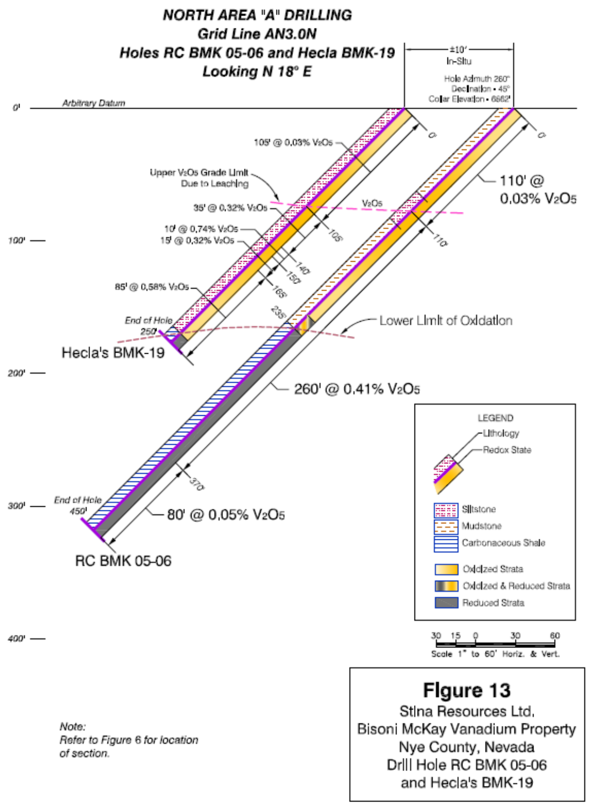


Figure 13
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Hole RC BMK 05-06
and Hecla's BMK-19

Table 7B
Bisoni McKay Vanadium Property,
Area A-South
2005 RC Holes – Composited Grades

From	To	Downhole	Approx. True	V		V_2O_5	V_2O_5
(feet)	(feet)	Interval (feet)	Width (feet)	(ppm)	V_2O_5 (ppm)		
Hole No. RC BMK 05-01 – Grid line AN 1.0S TD - 400'							
0	10	10	260'	297	530	0.05	1.06
10	315	305		2,531	4,518	0.45	9.04
315	550	235		278	497	0.05	0.99
Hole No. RC BMK 05-02 – Grid line AN 2.0S TD - 400'							
0	230	230		607	1,084	0.11	2.17
230	350	120		3,059	5,460	0.55	10.92
350	400	50		1,705	3,049	0.30	6.09
0	400	400		1,480	2,642	0.26	5.28
Hole No. RC BMK 05-03 – Grid line AN 3.0S TD – 410' 80° dip estimate							
0	185	185		513	915	0.09	1.83
185	360	175		1,763	3,147	0.31	6.29
360	410	50		161	288	0.03	0.68

Table 7C
Bisoni McKay Vanadium Property,
Area A North
2005 RC Holes – Composited Grades

From (feet)	To (feet)	Downhole Interval (feet)	Approx. True Width (feet)	V (ppm)	V_2O_5 (ppm)	V_2O_5 (%)	V_2O_5 (lb/st)
Hole No. RC BMK 05-04 – Grid line AN 1.0N TD – 440' 85º dip estimate.							
0	55	55		394	696	0.07	1.39
55	205	150	230'	2,871	5,124	0.51	10.25
205	330	125		2,122	3,787	0.38	7.57
330	440	110		165	295	0.03	0.39
Hole No. RC BMK 05-05 – Grid line AN 2.0N TD – 500'							
0	80	80		279	497	0.05	0.99
80	255	175		2,529	4,514	0.45	9.03
255	320	65		2,016	3,599	0.36	7.20
320	550	180		161	287	0.03	0.57
Hole No. RC BMK 05-06 – Grid line AN 3.0N TD - 450'							
0	110	110		174	311	0.03	0.62
110	370	260		2,307	4,119	0.41	8.24
370	450	80		296	528	0.05	1.06
Hole No. RC BMK 04-02 TD-295'							
0	295'			All grades below 0.1%			

General Observations from 2005 Drilling

Grade changes do not necessarily coincide with the relatively minor lithological breaks identified in logged drill core and chips such as the minor grain size differences between siltstone, mudstone and shale. Also, elevated vanadium grades sometimes span the redox boundary and may occur in oxidized as well as reduced (carbonaceous) lithologies indicating that vanadium has not necessarily been leached from the parts of the oxidation zone or possibly are remnants of previous enrichment the survived the downward movement of the redox boundary. In most holes, however, the vanadium appears to have been partially leached from portions of the oxidized rock as is obvious from the usually sharp increase of vanadium grade below the redox boundary. Evidence for leaching is seen in the mixed reduced and oxidized intervals in RC BMK 05-02 where higher grades remain in islands of reduced shale, and from the contrasting grades in the oxidized zones of nearby holes, RC BMK 05-03 and Hecla's BMK-16 (Figure 10). The deep redox boundary could represent an ancient water table stand, and, given past wetter climatic conditions, much of the oxidation probably occurred in the Pleistocene or early Holocene. Vanadium leaching may have been partially controlled by higher levels of pyrite found in some shale beds that would have created acidic vadose water and groundwater during the oxidation process. More recent weathering and soil forming processes may have leached much of the vanadium from the first five to ten feet below ground surface at some hole and trench sites. Caliche deposits are common near the ground surface.

Comparisons of field log observations and analytical results indicate that the vanadium grades in the carbonaceous shale do not appear to correlate well with observed pyrite content, quartz vein density, the character of limonite, or the abundance and character of other secondary minerals in the reduced zone. A more detailed examination at microscopic levels, however, may not entirely support these observations.

The ALS Chemex multi-element analyses are useful in correlating contents of major and minor elements with vanadium variations. In particular, calcium (Ca), and manganese (Mn) concentrations generally decrease in sections where vanadium grades increase, and zinc (Zn) and phosphorus (P) tend to follow vanadium abundances. This is also supported by the 2007 drilling results. In the oxidized zone sulfur and iron as well as other elements (see "Local Geology" section) have been leached. Zinc and cadmium concentrations appear to be slightly enriched for a few tens of feet below the redox boundary. Evidence of supergene vanadium concentrations directly below the redox interface is discussed in the "Mineralization" section.

Item 10.2 Phase II - 2007 Drilling

The Phase II drilling program of twelve RC holes was conducted solely in the Area A North along two semi parallel base lines (Figures 6 and 24). The hole collars are set approximately 110 feet (± 32 m) apart along base lines W0+00 and W1+00 and the grid lines that cross normal to the base lines (Figure 6). Pairs of holes were located on grid lines AN 1.0N, AN 1.5N, AN 2.0N, AN 2.5N, AN 3.0N, and AN 3.5N. The pairs on three of these lines are completed with three 2005 RC holes. Three 2007 RC holes are located on AN 0.5N. The 2005 core holes were drilled at a common collar on AN 0+0. The two base line directions are azimuth 018^{o} and are subparallel to the strike of the vanadium trend. The distance
between the 2005 core holes in the south and BMK 07-04 in the north is approximately 600 feet. Most borings provide data ranging down to 300 to 400 vertical feet with two holes extending over 600 feet deep. Eight holes were declined at 45^{o} at azimuths of 288^{o} and include BMK 07-01, 02, 03, 04, 08, 09, 10, and 12. Two holes, BMK 07-05 and 11, were set at 65^{o} at the same azimuth as above. Holes BMK 07-06 and 07 were vertical and were the deepest at 625 feet and 645 feet. The 45^{o} holes are declined to intercept the steep eastward dip of the Woodruff Formation beds at the largest angle possible for the rig setup. Typical dips on the east limb range from 60^{o} to 90^{o} east. The two rows of borings would allow each line of holes to intersect the stratabound, tabular, east-dipping mineralization at two different levels. Each hole has intercepted the primary (reduced) and oxidized, near-surface V_2O_5 mineralization at different depths and lateral extension along strike of the same strata, and these staggered locations are needed to better determine lateral grade, dips, and geologic continuity for resource estimation.
Section drawings of the 2007 holes are plotted on Figures 7 and 14 through 20. The sections include one to three holes aligned along the grid lines (Figure 6). The three 2005 borings drilled in this area are included on the sections. As well, the three 2005 core holes, DDH BMK 05-01, 02 and 03 (Figure 7), will be included in the assessment of Area A North. Each section diagram includes the general rock type log and oxidation state, composite grades of selected intervals and footage markers, and some extrapolated geologic and mineralization information between holes and the surface. Figures 4 and 6 are plan maps showing hole locations and their horizontal projections. Similar to the data display for the 2005 drilling above, Tables 9A, 9B, and 9C show grades of composite samples of selected intervals of the chip sample assays collected every five feet. The V_2O_5 assays are those plotted on the hole section diagrams.

Discussion of Drill Results

Each RC boring advanced through an interval of oxidized shale that ranged from 150 to 200 vertical feet deep with most oxidation-reduction (redox) interfaces occurring at vertical depths of about 160 to 180 feet. As usual, because of partial leaching, the V_2O_5 concentrations in mineralized beds tend to vary more in the oxidized zone as compared with grades in the reduced shale, but most concentrations still remain greater than 0.2%. Significant amounts of vanadium remain in the oxidized zone in RC holes BMK 07-01, 02, 03, 04, 05, 08, 09, 10, and 12, but V_2O_5 grades generally average less than grades in the reduced shale (see Table 4 and Figures 7, 14 to 20) and are more erratic. Sometimes leaching makes it uncertain where to mark the upper limits of the original vanadium mineralization.

In holes that have penetrated the upper and lower limits of the main, reduced vanadiferous zone, there are intervals consisting of a number of contiguous samples containing 0.1% grades along the perimeters of the vanadiferous unit. At the redox boundary an abrupt grade break of several hundred parts per million (ppm) commonly occurs immediately above the redox boundary.

Most borings drilled through the mineralized intervals of the carbonaceous shale beds that range from 0.2% to greater than 1.5% V_2O_5, and then advanced through thin sequences of underlying, weakly mineralized beds of 0.1%-0.2% V_2O_5, before entering shale where vanadium values abruptly decline to hundreds of ppm. Significant vanadium grades can vary between roughly correlated beds in adjacent holes but do not typically fall below the range of grades of interest. Grade continuity of the mineralized carbonaceous shale between boring pairs and between holes along the base lines can be reasonably verified by the grades averages shown on the boring section diagrams (Figures 10 to 20) and on Tables 3 and 8. There are no abrupt, severe grade decreases or increases laterally between holes, especially in the reduced mineralization, such as would likely occur between two or more mineral-bearing base or precious metal hydrothermal veins or between vein dilations.

Within the vanadiferous shale section of interest, intervals below 0.2% are relatively infrequent in most holes, especially in the reduced zone. There are scattered, discontinuous sequences of beds containing weakly mineralized V_2O_5 grades ranging from 0.1% to 0.2% that vary from 5 to 25 feet thick.. A very small minority of the intervening grades are less than 0.1%. Table 8 shows the percentages of beds less than 0.2% V_2O_5 in the oxide and reduced sections of each 2007 hole and the three 2005 core holes. The percentages do not include the apron of beds carrying 0.1% grades that typically lead into and follow the primary package of mineralized bedding. Several of the 2005 and 2007 borings have advanced into background shale (hundreds of ppm V) below the principal vanadiferous zone and have intersected thin, isolated beds carrying mineralization ranging from 0.2%-0.3% that are of no significant interest at this time.

The narrow transition or perimeter zone between mineralization of economic interest (0.2% V_2O_5) and anomalous background rock (<0.1%) at the bottom of the vanadiferous unit may be significant for future planning.

Table 8
Percentage of Beds less than <0.2% Nested within >0.3% V_2O_5 Grade Intervals (feet)

	<0.2/ intervals		**<0.2/ intervals**		**<0.2/ intervals**		**<0.2/ intervals**
07-01		**07-02**		**07-03**		**07-04**	
oxide	0%/140’	oxide	4.5%/220’	oxide	4%/250’	oxide	12%/120’
reduced	na*	reduced	0%/35’	reduced	5%/200’	reduced	0.6%/150’
07-05		**07-06**		**07-07**		**07-08**	
oxide	0.6%/165’	oxide	na**	oxide	0%/20’	oxide	0%/140’
reduced	3%/65’t	reduced	23%/340’	reduced	13%/230’	reduced	0%/120’
07-09		**07-10**		**07-11**		**07-12**	
oxide	0%/135’	oxide	14%/220’	oxide	1.4%/70’	oxide	7%/200’
reduced	0%/125’	reduced	0%/60’	reduced	13%/300’	reduced	na*
DDH 05-01		**DDH 05- 02**		**DDH 05-03**			
oxide	7%/210’	oxide	30%/230’	oxide	3%/453’		
reduced	0%/10’	reduced	0%/95’	reduced	na*		

na* - no 0.3% na**- less than 0.2% oxide beds

Good grade continuity can also be seen on the Phase I sections in Area A-South between RC BMK 05-01, 02 and 03 and core holes DDH RMK 05-01, 02, and 03 (Table 9). The section drawing for RC BMK 05-03 also includes the Hecla boring BMK-16 (Figure 10).

The compatible grades and geological controls the between the latter holes in Area A-South and the tighter hole intervals in Area A North suggest that a valid inferred resource can be calculated for the south half using the wider spaced borings. See also Table 9 for grades in holes in Area A-South. Figures 8, 9, and 10 are section drawings for RC BMK 05-01, 02, and 03. It should be noted for Table 9 that the shorter intervals of above-cutoff grades do not necessarily indicate a thinning mineralized package of beds. Some holes entered the mineralized facies well below the top of the facies and other holes terminated inside the mineralized interval due to drilling problems or difficulties in visually distinguishing mineralized and unmineralized reduced shale in cuttings.

Table 9
Average V_2O_5 Grade above 0.2% in Reduced Beds Intersected by 2007 RC Borings and 2005 RC & DDH Borings

Hole #	Drill Interval (ft)	Av. Grade %	Hole #	Drill Interval (ft)	Av. Grade %
Area A North - RC			BMK05-04	70	0.46
BMK07-01	none		BMK05-05	100	0.42
BMK07-02	35	0.45	BMK05-06	125	0.42
BMK07-03	200	0.42	Area A-South - RC		
BMK07-04	150	0.41	BMK05-01	135	0.50
BMK07-05	40	0.29	BMK05-02	165	0.48
BMK07-06	355	0.34	BMK05-03	145	0.34
BMK07-07	230	0.37	DDH Holes - Area A North		
BMK07-08	140	0.49	BMK05-01	93	0.85
BMK07-09	135	0.47	BMK05-02	128	0.92
BMK07-10	60	0.57	BMK05-03	275	0.48
BMK07-11	300	0.39			
BMK07-12	10	0.27			

Note: The DDH holes are located at the south end of Area A North

Establishing the true width or thickness of the vanadiferous package of beds depends on determining a best dip estimate based on current observations of the bedding intersected by the each of the borings and from the few surface attitudes measured (see Tables 10A, 10B, 10C, 7A, 7B and 7C for width estimates for each hole).

From extrapolations using the bottom and top limits of the vanadiferous beds in DDH BMK 05-01, 02 and 03 and RC 04-02, the general dip is estimated at 70^o- 75^o eastward, and the minimum thickness of the vanadium-enriched unit is about 295 feet (Figure 7). Many core angles of bedding support the estimated dips, but the variations of the core angles in any one hole suggest undulated or contorted bedding (as is observed in some nearby trench exposures). Using the sequence of the three aligned RC holes directly north of the core holes, RC BMK-07-01, 02 and 03, and correlating the bottom of the mineralization suggest that the dips here may be near vertical or even slightly overturned, especially at the west end of the borings that could be effected by flexure along the axis of an anticline (Figure 14). A minimum thickness of 300 feet is measured from BMK 07-03, which has intersected mineralization throughout its 450-foot length.

Some pairs of other holes drilled on base lines W0+00 and W1+00 present complications for assay correlations. Extrapolations of the lower and upper V_2O_5 limits of pairs of holes BMK 07-05 and 11, BMK 07-08 and 07, and BMK 07-04 and 06 (Figures 16, 18, 20) suggest a dip angle decrease to the north. The remaining pairs are between 2007 and 2005 holes or between Stina holes and Hecla holes are not drilled on the same vertical plane, thus are difficult to match V_2O_5 limits for dip estimations. Dips observed in the trenches (Trench 24 and 25) traversing the oxidized vanadiferous unit reveal that bedding angles exhibit local contortions and are somewhat inconsistent (see Figure 4 for bedding attitudes).

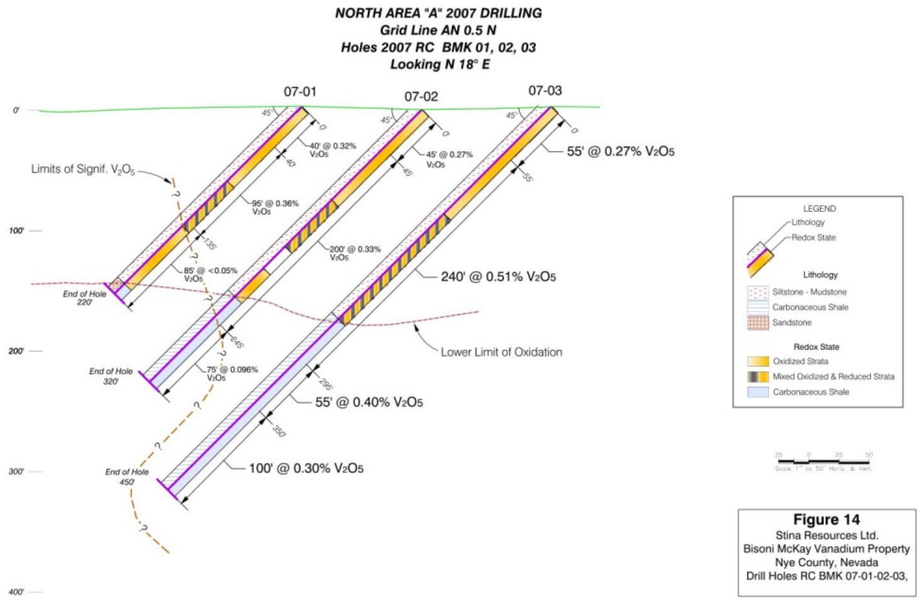


Figure 14
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-01-02-03,

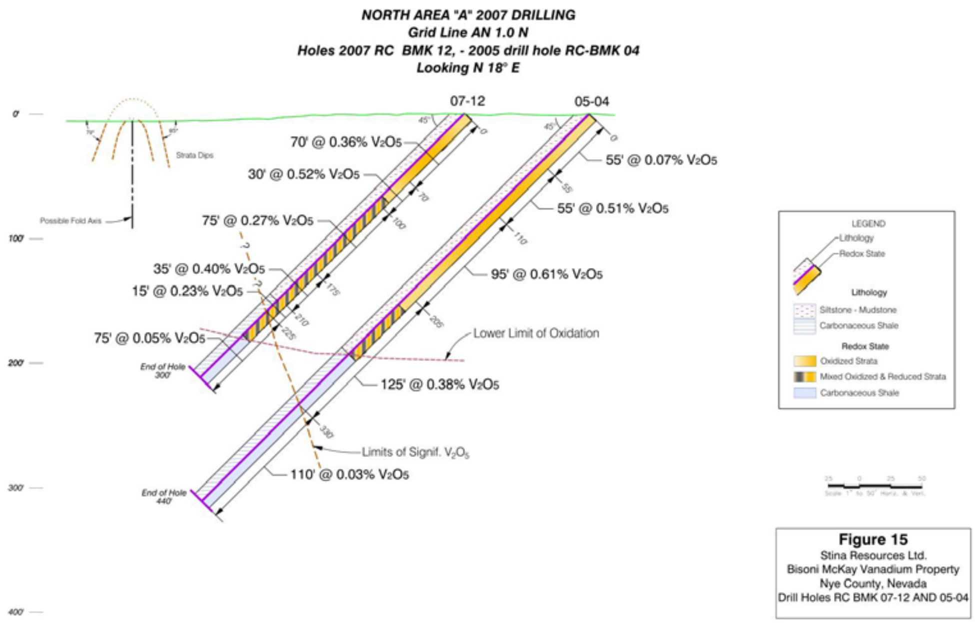


Figure 15
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-12 AND 05-04

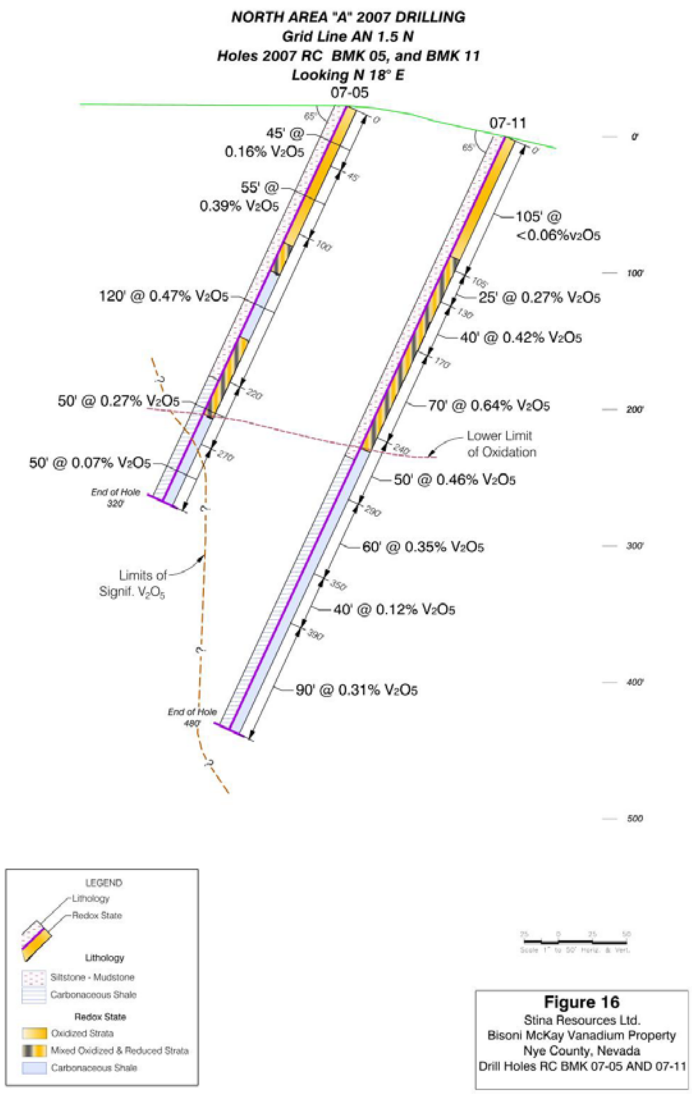


Figure 16
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-05 AND 07-11

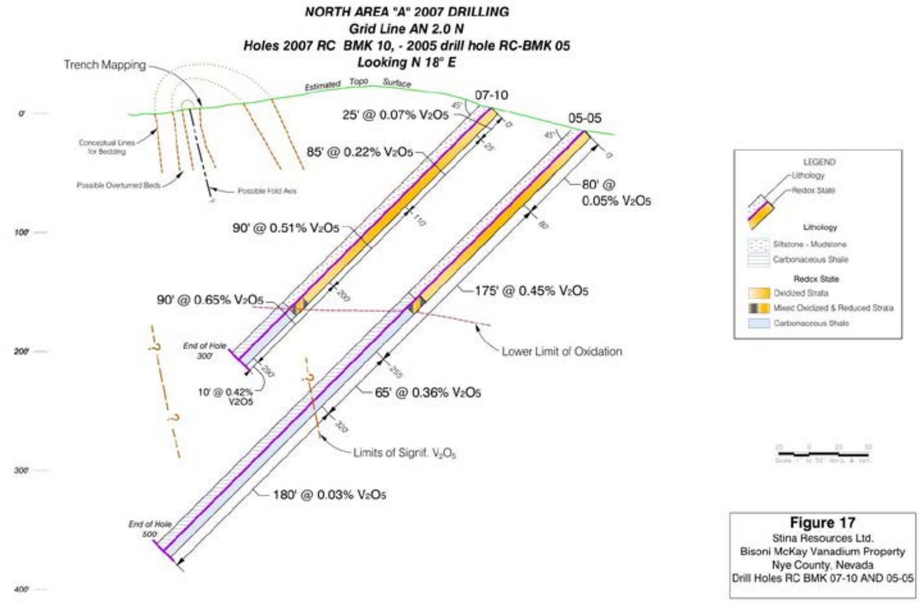


Figure 17
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-10 AND 05-05

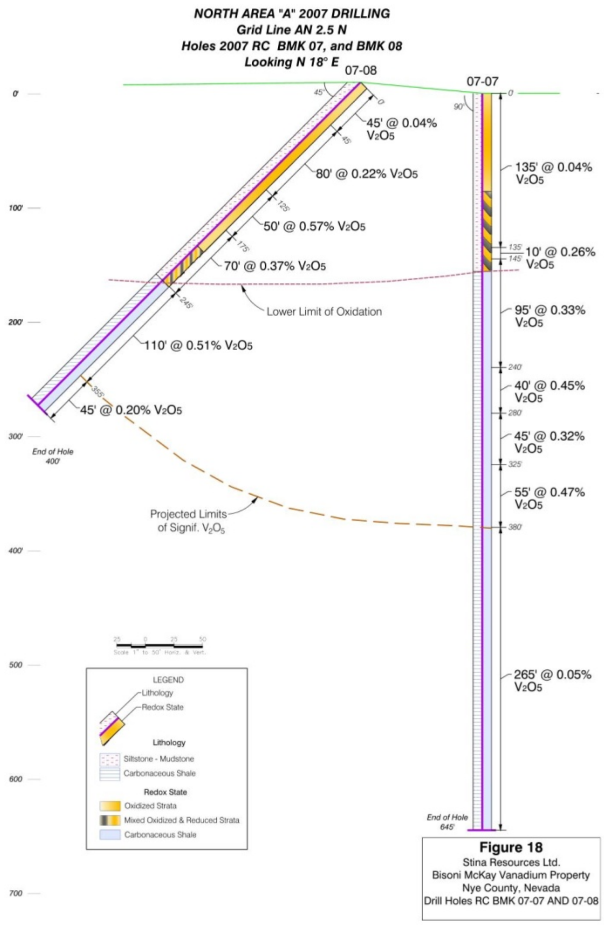


Figure 18
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-07 AND 07-08

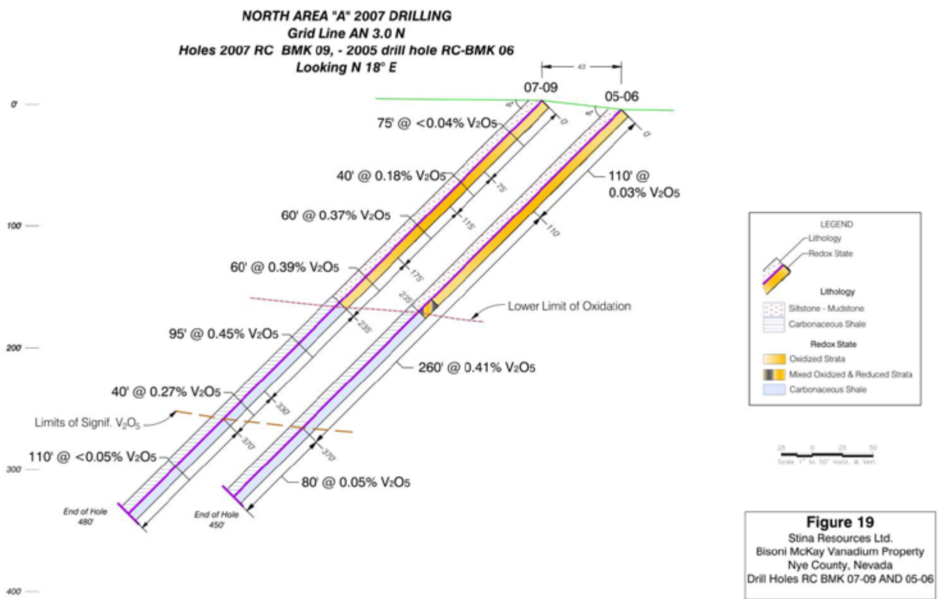


Figure 19
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-09 AND 05-06

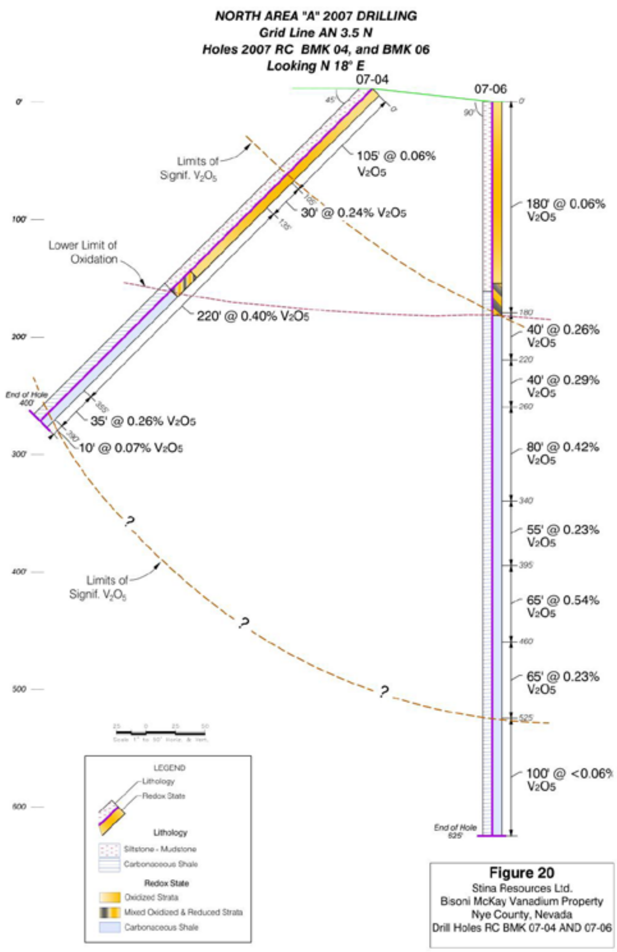
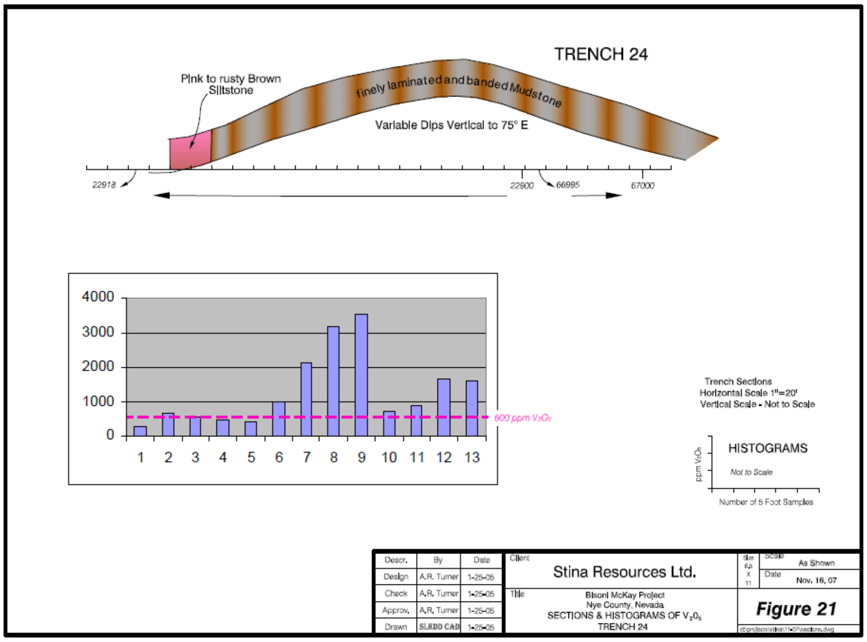
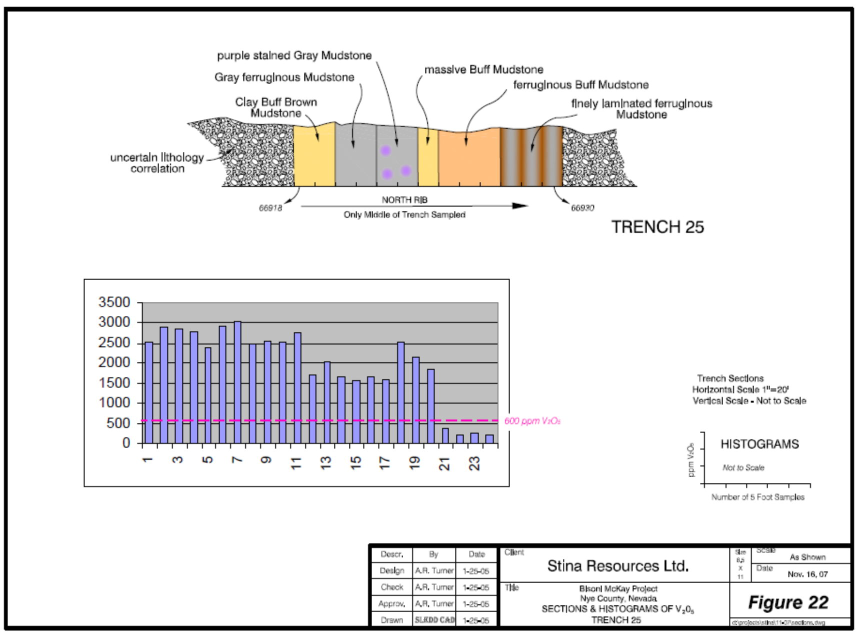


Figure 20
Stina Resources Ltd.
Bisoni McKay Vanadium Property
Nye County, Nevada
Drill Holes RC BMK 07-04 AND 07-06





As mentioned in the "Local Geology" subsection, the bedding dips in trench exposures near the fold axis and fault west of the drilling grid become steeper and approach vertical and possibly overturned attitudes. Correlating the bottom of the mineralization in several of the pairs of 2007 borings usually show very steep dips assuming that the bottom of the mineralization is controlled by the same bedding.

The nature of the fold hinge and the position and dip of the fault along the western side of the mineralized belt in Area A North block is still uncertain. The resolution of the thickness and disposition of the mineralized beds in this area remains uncertain until more drilling is carried out across these beds and through the projected fault zone. The doubling up of the mineralization thickness due to tight folding and overturning may be an attractive possibility.

Table 9 shows the vanadium assay averages consisting of significant grade intervals above 0.2% within the reduced lithology zone of each 2007 boring and the grade averages from the reduced beds in the three 2005 RC borings and the three core holes (DDH). Given that part of the grade variations is due to the varying intersection lengths of the reduced zone in each hole, the V_2O_5 grades do reflect a relatively even tenor along strike and down dip of the shale across the target area. In each hole the significant V_2O_5 grades are measured from the bottom of the oxide zone to the terminus of the beds carrying grades of greater than 0.2% V_2O_5. At the lower level of the 0.2 cutoff the grades typically drop off within the space of a few feet to less than 0.2% V_2O_5 signaling the bottom of the vanadiferous zone. The 0.2% grade is considered the lower limit of significant mineralization at BMK.

The dips of the lower limit plane of significant V_2O_5 follows the Woodruff bedding as plotted from drill hole assays, shown on Figures 14, 15 and 16. Near the Woodruff/Webb fault the beds become very steep and tightly folded bedding with possible secondary fault ruptures and drag faulting compared with more moderate dips farther east (as mentioned in the "Geology Setting" section). The actual fault zone may be about 200 feet west of these holes. Farther east of the fault the bedding dips and the eastward V_2O_5 limit line dip become flatter and much less deformed. One possible benefit for evaluating this rupture zone is that a greater length of vanadiferous beds are compressed and folded together forming a thick, potentially-productive zone.

Table 10A
Bisoni McKay Vanadium Property – North Half Area A,
2007 RC Holes – Composited Grades

From (feet)	To (feet)	Downhole Interval (feet)	Min. True Width (feet)	V (ppm)	V_2O_5 (ppm)	V_2O_5 (%)	V_2O_5 (lb/st)
Hole No. RC BMK 01 Grid Line: AN 1+00, W 2+00 TD-220' 85º-90º dip est.							
0	40	40		180	320	0.032	0.64
40	135	95		202	360	0.036	0.7
135	220	85				<0.005	
Hole No. RC BMK 02 Grid Line: AN 1+00 W1+00 TD-320' 90º dip est.							
0	45	45	130'	1517	2700	0.27	5.4
45	245	200		1854	3300	0.33	6.6
245	320	75		539	960	0.096	1.9
Hole No. RC BMK 03 Grid Line: AN 1+00 W0+00 TD-450' 90º dip est.							
0	55	100		1517	2700	0.27	5.4
55	295	240		2865	5100	0.51	10.2
295	350	55	300'	2247	4000	0.40	8.0
350	450	100		1685	3000	0.30	6.0
Hole No. RC BMK 04 Grid Line: AN 3.5 W1+00 TD-400' 75º dip est.??							
0	105	105				<0.06	
105	135	30		1348	2400	0.24	4.8
135	355	220	195'	2247	4000	0.40	8.0
355	390	35		1461	2600	0.26	5.2
390	400	10			700	0.07	
Hole No. RC BMK 05 Grid Line: AN 1.5 W 1+00 320' 90º dip est.							
0	45	45			160	0.16	
45	100	55		2191	3900	0.39	7.8
100	220	120	100'	2640	4700	0.47	9.4
220	270	50		1517	2700	0.27	5.4
270	320	50				<0.07	
Hole No. RC BMK 07-06 Grid Line: AN 3.5 W0+00 TD-625' 35º dip est??							
0	180	180			600	0.06	
180	220	40		1461	2600	0.26	8.2
220	260	40		1629	2900	0.29	5.8
260	340	80		2359	4200	0.42	8.4
340	395	55		1292	2300	0.23	4.6
395	460	65		1910	3400	0.34	6.8
460	525	65		1292	2300	0.23	4.6
525	625	100			600	<0.06	

Note: Projected dips are only estimated from the few surface dips measured and from correlating grade intervals usually at the bottom of the mineralization. Bed surface exposures in trenches appear to be somewhat crenulated or contorted making subsurface dip changes difficult to predict. Dips may also change from one end of the trench to the other and angles often appear to decrease to the east. Projecting dipping beds at the west end of the boring projects are complicated by folding, possible overturning and a fault offset.

Table 10B
Bisoni McKay Vanadium Property – North Half Area A
2007 RC Holes – Composited Grades

From (feet)	To (feet)	Downhole Interval (feet)	Est. True Width (feet)	V (ppm)	V_2O_5 (ppm)	V_2O_5 (%)	V_2O_5 (lb/st)
Hole No. RC BMK 07-07	**Coord: AN 2.5 W 0+00 TD-645’**						
0	135	135			400	0.04	
135	145	10		1461	2600	0.26	5.2
145	240	95		1854	3300	0.33	6.6
240	280	40		2528	4500	0.45	9.0
280	325	45		1798	3200	0.32	6.4
325	380	55		2641	4700	0.47	9.4
380	645	265			500	0.05	
Hole No. RC BMK 07-08	**Coord: AN 2.5 W 1+00 TD-400’** 90º dip estimate						
0	45	45			400	0.04	
45	125	80	220’	1236	2200	0.22	4.4
125	175	50		3202	5700	0.57	11.4
175	245	70		2079	3700	0.37	7.4
245	355	110		2865	5100	0.51	10.2
355	400	40		1123	2000	0.20	4.0
Hole No. RC BMK 07-09	**Coord: AN 3.0 W 1+00 TD-480’** 90º dip estimate						
0	75	75				<0.04	
75	115	40	225’	1011	1800	0.18	3.6
115	175	60		2079	3700	0.37	7.4
175	235	60		2191	3900	0.39	7.8
235	330	95		2528	4500	0.45	9.0
330	370	40		1517	2700	0.27	5.4
370	480	110				<0.05	

Table 10C
Bisoni McKay Vanadium Property – North Half Area A,
2007 RC Holes – Composited Grades

From (feet)	To (feet)	Downhole Interval (feet)	Est. True Width (feet)	V (ppm)	V_2O_5 (ppm)	V_2O_5 (%)	V_2O_5 (lb/st)
Hole No. RC BMK 07-10 Coord: AN 2.0 W 1+00 TD-300’							
0	25	25			700	0.07	
25	110	85		1236	2200	0.22	4.4
110	200	90		2865	5100	0.51	10.2
200	290	90		3652	6500	0.65	13
290	300	10		2359	4200	0.42	8.4
Hole No. RC BMK 07-11 Coord: AN 1.5 W 0+00 TD-480’ 90º dip estimate							
0	105	105				<0.05	
105	130	25	>180’	1517	2700	0.27	5.4
130	170	40		2360	4200	0.42	8.4
170	240	70		3595	6400	0.64	12.8
240	290	50		2584	4600	0.46	9.2
290	350	60		1966	3500	0.35	7.0
350	390	40		674	1200	0.12	2.4
390	480	90		1742	3100	0.31	6.2
Hole No. RC BMK 07-12 Coord: AN 1.0 W 1+00 TD-300’ 90º dip estimate							
0	70	70	180’	2202	3600	0.36	7.2
70	100	30		2921	5200	0.52	10.4
100	175	75		1461	2600	0.26	5.2
175	210	35		2247	4000	0.40	8.0
210	225	15		1292	2300	0.23	4.6
225	300	75				0.05	

General Observations from 2007 Drilling

The detailed drilling at 110-foot centers on Area A North has encountered grade continuity exceeding grades of 0.35% V_2O_5 between holes. The boring results demonstrate the continuity of vanadium distribution within a belt of fairly homogenous carbonaceous shale. It is reasonable to assume that the extension of these conditions extend to Area A-South through the intersections of RC holes BMK 05-01, BMK 05-02, and BMK 05-03. The steepening dips that are encountered on the west end of many of the 2007 borings are likely the effect of the fold axis and faulting.

There appears to be a slight average increase of grade between the 2005 core holes DDH BMK 05-01, 02, and 03 and 2005 RC holes BMK 05-01, 02, and 03 and the lower averages in the neighboring group of 2007 RC holes to the north, BMK-07-01 to 12.. The slight elevated grades in the 2005 core and RC holes compared with adjacent 2007 RC holes can be quickly discerned in Table 9 and by average grade comparisons between the DDH borings in Table 7A and RC holes in Tables 7B, 7C, and 10A. The reasons for the grade contrasts are only conjectural at this time, possible even a lab bias. Thus far there does not appear to be any differing, unique, noticeable geological phenomena between the borings. However, the average increased grade tenor immediately south of the core holes suggests a possible, slightly better endowed mineralized facies to the south. This condition will be investigated further with the next period of field work which will include additional core holes in the south half of Area A. The possibility of systematic under-represented grades in RC holes may increase the tenor of mineralization throughout Area A.

ITEM 11 - SAMPLE PREPARATION, ANALYSES AND SECURITY

Much of the preparation for reverse circulation drill samples was carried out during the drilling when drill cuttings are being produced. Splitting drill chip discharge into sample increments was done with a cyclone splitter. To eliminate contamination the splitter was cleaned between each sample interval. RC samples were collected every 5 feet. At least two sample splits were taken and bagged at each five foot sample interval, one for a lab sample and a second bag, is a reserve sample, if needed. The reserve samples are kept for a longer term in a secure warehouse in Eureka, NV, and held for additional analyses and observations if needed. In addition, a collection of chip trays hold representative samples from each sample interval and have a ready sample to look at in the exploration office. For every 20-25 sample intervals another sample was collected form the drill discharge for duplicate QAQC analyses as a blind check for the lab. The sample bags are numbered and the lab ticket is also included inside the bag before closing. The geologist or an associate takes the lab and reserve samples to the secure storage building. In the field as well in transport the storage unit or lab, the vehicle carrying the samples is secured by the geology staff and/or drill crew. Once in the storage building the samples are locked up until sent to the laboratory while the remainder remains secured in Eureka. Stina personnel delivered the lab samples for analyses at the ALS Chemex's lab facility at Reno or Elko, NV.

The quality control/quality assurance activities included preserving the integrity of the sample composition such as avoiding contamination while drilling and during preparing samples such as during splitting, handling cuttings, preventing mixing cross contamination of cuttings from different sample intervals, and proper sample labeling and completing lab forms.

Samples from trenches, core and RC drilling were prepared and split in the laboratories of ALS Chemex in Reno, Elko and Winnemucca, Nevada. Assay pulps were air-freighted to ALS Chemex in Vancouver, British Columbia, Canada, for analysis. ALS Chemex laboratories are certified in North America (ISO 17025), Peru, Chile and Argentina. The drill sample collection methods and subsequent sample handling and security while in the field and during transport to the ALS lab facility meets the industry's standards for preserving the security and integrity of the samples. The resulting analytical data are satisfactory representatives of the in-place rock compositions.

All samples were dried in ovens, weighed and then crushed to 70% nominal minus six millimeters (–6mm) using jaw and/or roll crushers. A second fine crushing pass gave a product of 70% minus two millimeters (-2mm) or better. The sample was then split in a riffle splitter to obtain a 250 gram (gm) sample. The 250 gm split sample was pulverized to a powder with 85% passing 75 micron, or better, using a "flying disk", or ring and puck style, grinding mills. An air-freight courier transported the sample splits to ALS Chemex's laboratories in Canada.

The samples were analyzed by ALS Chemex's ME-ICP61 method, which is a four acid "near total" digestion that dissolves nearly all elements for the majority of geological materials. Twenty seven (27) elements were analyzed following HF- HNO_3 – $HClO_4$ acid digestion and an HCl leach.

The samples were analyzed using Induction Coupled Plasma Atomic Emission Spectra (ICPAES). The following elements, with their analytical ranges, provided by this method are shown in Table 11.

In my opinion the sample preparation, analyses, and security meets Quality Assurance and Quality Control (QA/QC) standards for acceptable results.

Table 11
ALS Chemex
Analytical Ranges Using Method ME-ICP61

Element	Symbol	From (ppm)/%	To (ppm)/ %	Element	Symbol	From (ppm)/ %	To (ppm)/ %
Silver	Ag	0.5	100	Manganese	Mn	5	10,000
Aluminum	Al	100	25%	Molybdenum	Mo	1	10,000
Arsenic	As	5	10,000	Sodium	Na	100	10%
Barium	Ba	10	10,000	Nickel	Ni	1	10,000
Beryllium	Be	0.5	1,000	Phosphorus	P	10	10,000
Bismuth	Bi	2	10,000	Lead	Pb	2	10,000
Calcium	Ca	100	25%	Sulfur	S	100	10%
Cadmium	Cd	0.5	500	Antimony	Sb	5	10,000
Cobalt	Co	1	10,000	Strontium	Sr	1	10,000
Chromium	Cr	1	10,000	Titanium	Yi	100	10%
Copper	Cu	1	10,000	Vanadium	V	1	10,000
Iron	Fe	100	25%	Tungsten	W	10	10,000
Potassium	K	100	10%	Zinc	Zn	2	10,000
Magnesium	Mg	100	15%				

ITEM 12 - DATA VERIFICATION

All samples from the holes drilled in 2005 were re-analyzed for vanadium using ALS Chemex's V-AA62 method (MS 81). This method uses the digestion liquid as described above for the ME-ICP61 method and analyses for vanadium were made by Atomic Absorption Spectrometry (AAS). This method yields vanadium results in the range 0.01% to 30 % vanadium.

A comparison of average V_2O_5 results, using ME-ICP61 and MS 81 analytical methods, on 120 drill hole samples from the initial 2004 Phase 1 RC holes BMK 04-01 and 02 is shown in Table 12.

Table 12 Bisoni McKay Vanadium Deposit Comparison of 2005 Assay Results – ICP61 versus MS81 methods			
Analytical Method	**120 Samples V_2O_5 (ppm)**	**Samples V_2O_5 < 1000 ppm**	**Samples V_2O_5 > 1000 ppm**
ICP 61	0.090	0.037 (92 samples)	0.264 (28 samples)
MS 81	0.089	0.038 (98 samples)	0.289 (24 samples)

The averages of all 120 samples analyzed by the two methods are very similar. Samples that analyzed less than 1000 ppm V_2O_5 by the two methods show close correlations. There is, however, a greater spread between the two methods for the samples that analyzed greater than 1000 ppm V_2O_5 with the MS 81 results being 9% higher than those for the ICP61 method. The MS 81 method was not used for the analysis of V_2O_5 in the trench samples and all results reported in the April 16, 2006 Technical Report appendices and in the text for these samples are based on the ICP61 method. Based on the data tabulated above it seems likely that the trench V_2O_5 analyses understate the grade.

The Phase II 2007 drill samples were analyzed by ALS Chemex using solely the ICP61 method. The correspondence between methods ICP61 and MS 81 in 2005 was satisfactory to trust the validity of ICP61. Eight paired duplicate samples with V_2O_5 contents exceeding the mean were rerun in the 2007 program. The sample results are presented in Table 13; the close association between the original and the rerun values supports a valid analyses result and an acceptable lab procedure. In my opinion the analytical data verification meets the expected validation factors resulting from the sample collection, security, sample preparation and analyses procedures. In accordance industry standards, the resource evaluation and the results are sufficiently representative of the V_2O_5 grades shown the technical report.

Table 13 2007 Duplicate Sample Assay Check			
RC Boring	Sample Interval	Original V Assay %	Rerun V%
BMK 07-03	255-260	0.89	0.91
BMK 07-03	260-265	0.50	0.52
BMK 07-05	185-190	0.66	0.67
BMK 07-05	190-195	0.53	0.54
BMK 07-10	205-210	0.56	0.57
BMK 07-10	210-215	0.53	0.55
BMK 07-11	195-200	0.48	0.49
BMK 07-11	200-205	0.48	0.50

In my opinion the data verification methods meet industry standards for Quality Assurance and

Quality Control (QA/QC) at the labs used, and in the preparation of the samples. (See Item 11 above).

ITEM 13 - MINERAL PROCESSING AND METALLURGICAL TESTING

Historically at least two other companies have performed metallurgical studies to evaluate the extraction of vanadium from vanadiferous shales on the Bisoni McKay Property. These companies included Noranda and TRV Resources - Inter-Globe Resources. The studies, carried out between 1970 and 1989, are not available for review. Only the Stina-funded Hazen Research Inc. study of January 31, 2007 is available for appraisal (see Appendix 2).

Mr. Edwin Bentzen, an extractive metallurgist and an Associate of Resource Development Inc. is responsible for the discussion 13, 17, 21, 22, and portions of Items 1, 2, 3, 25 and 26 - the portions relating to mineral processing. Mr. Bentzen was engaged by Stina Resources during the fall of 2015 to assess the technical aspects of the mineral process studies. His evaluation of Hazen's metallurgical scoping study introduces the general range of Phase III work that may be conducted. The scoping level study demonstrated that a technically viable process consisting of oxidizing roast (possible salt roast) followed by acid pugging, curing and leaching with concentrated sulfuric acid is hoped to provide good vanadium extraction from all vanadium-bearing mineralized zones. Other less orthodox extraction steps will also be considered and tested. The recovery process needs to be optimized prior to undertaking the economic viability of the process.

ITEM 13.1 Scoping Metallurgical Study

Stina contracted Hazen Research, Inc. in 2006 to perform a scoping-level metallurgical study on selected rotary cutting and core samples collected during the 2005 drilling program. The primary objective of this phase of the test program was to test various processing alternatives to bring vanadium into solution in order to separate it economically from the host (gangue) minerals.

The scoping level metallurgical study included preparation of three composites (oxide, transition and carbonaceous), head analyses, mineralogical investigations, magnetic separation, leaching along with roasting ,followed by leaching tests. The details of the study are provided in the Hazen Research, Inc. report titled "Vanadium Extraction Experiments on Bisoni - McKay Ore Samples" dated January 31, 2007. The highlights of the study indicated the following:

- The vanadium-bearing shale can be classified into three mineralized zones: oxide, transition and carbonaceous.
- The three composites studies assayed 0.26% to 0.30% V, 0.05% to 1.66% S_{Total}, 0.80% to 0.88% Fe and 0.42% to 8.3% O_{rganic} (Table 14).

Table 14. Head Assays of Composite Samples

Mineralized Zone	Assay, Wt. %					
	CO_2 as C	C_{tot}	C_{org}	V	S_{tot}	Fe
Oxide Zone	0.06	0.48	0.42	0.30	0.05	0.85
Transition Zone	0.27	3.6	3.3	0.26	0.44	0.80

Carbonaceous Zone	0.31	8.7	8.3	0.30	1.66	0.88

- The composites were relatively low in carbonate carbon and therefore, should be low in acid consuming carbonate minerals.

- Mineralogical studies indicated that vanadium is associated with ferric oxide for the oxide composite and with organic carbon matter and ferric oxide for the carbonaceous and transition composites.

- Dry and wet magnetic separation studies indicated limited upgrading of the vanadium into the magnetic fraction but the overall recovery was poor, especially for the transition and carbonaceous composites.

- Several lixiviants (dilute H_2SO_4 with/without SO_2 and Na_2CO_3) were evaluated in direct leaching tests on pulverized composite samples. The vanadium extraction was relatively low (11% to 33% recovery), even with relatively high reagent dosages.

- Acid pugging, curing and leaching with concentrated sulfuric acid resulted in over 90% of vanadium extraction from the oxide composite but only 50% to 56% extraction from the other two composites. Hence, vanadium associated with organic carbon needs to be liberated, or totally oxidized, prior to it being extracted by the sulfuric acid leach process.

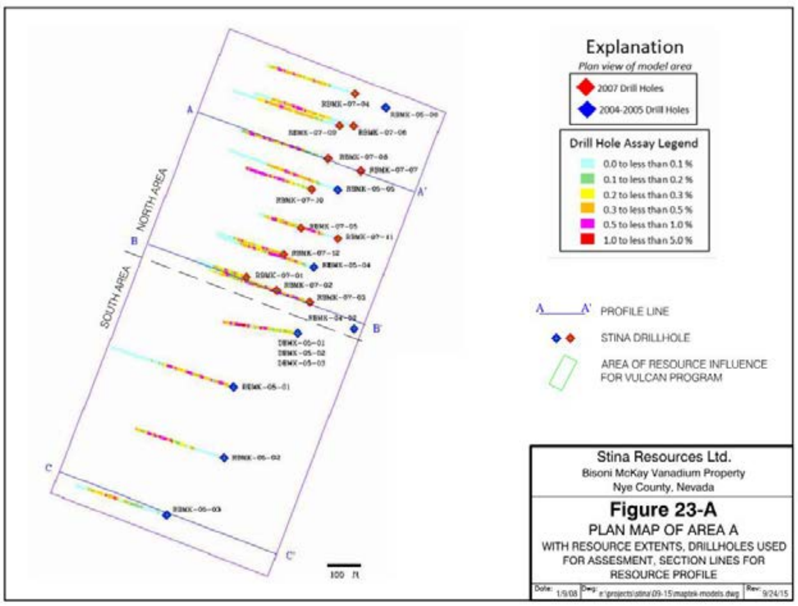
- Oxidizing roast at 625ºC to 750ºC followed by salt roast and acid leach improved the vanadium extraction for the transition and carbonaceous composites to 70% to 76%. These results indicate that oxidizing roast did partially destroy carbonaceous material, as chemical analyses of the roasted and leach products still determined the presence of organic carbon material. Additional testing is needed to optimize process variables for improvement in the vanadium extractions.

- It is noted that the acid consumption was high in these scoping level tests. Since the reduced mineralization contains very little carbonates, the acid consumption should be low. The reason for high acid consumption needs to be further investigated.

The scoping level study demonstrated that a technically viable process consisting of oxidizing roast (and possible salt roast) followed by acid pugging, curing and leaching with concentrated sulfuric acid will provide good vanadium extraction from all mineralization types. The process needs to be optimized prior to undertaking the economic viability of the process. Some of the optimization methods being considered are less conventional vanadium recovery procedures.

ITEM 14 - MINERAL RESOURCE ESTIMATES

In November 2007 Maptek (KRJA Systems, Inc. dba Maptek) of Lakewood, Colorado, under contract to Stina Resources, completed a V_2O_5 mineral resource estimate of the portion of Area A drilled in 2005 and 2007. As qualified person (QP), I take responsibility for the mineral resource estimate results. Mineral reserve estimates were not produced for this technical report. The resource estimate was calculated using the Vulcan 3D software program with the geomodeller bundle. Maptek developed the Vulcan program which has been used to evaluate mining properties worldwide. The vanadiferous trend in Area A is shown in the plan view on Figures 3, 4, and 6. The resource estimate is restricted to the part of Area A that is delimited by the 2007 RC and 2005 RC holes and the 2005 DDH holes as plotted on Figures 4 and 23-A. This appraisal is the first recent approximation of indicated and inferred resources at Bisoni McKay. Based on existing exploration results, additional drilling in Area A will expand the depth and lateral extent of V_2O_5 resources.



Importantly, the drill hole spacing on Area A North has generated confidence in the continuity of the vanadium distribution which, from comparisons of other drill hole data at BMK, appears to be generally representative of a typical mineralized sequence on the property. Based on the predictable stratigraphic and overall grade continuity, an inferred and indicated resource has been estimated for much of Area A North and an inferred resource was considered appropriate for Area A-South (see Figure 23B).

Grade Estimation and Validation Using the Vulcan Program

Due to the broad continuity and thickness of the mineralized trend in the shale host, the inverse distance method was chosen for the grade estimation in Area A. The inverse distance method denotes grades for each block within the Vulcan block model. To locate the grade samples for each block estimate, the Vulcan program uses a search ellipse with dimensions of 400 feet in the x-direction, 400 feet in the y-direction, and 200 feet in the z-direction at a trend of 21°NE and plunge of 20°. Each estimate had a minimum requirement of two samples and a maximum of 40 samples. Also, to ensure a more accurate estimate for the block model, the calculations required a limit of three samples per drill hole. When the estimate is processing, the ellipse is centered within each block, and any assay samples that fall within the ellipse, according to the sample limits, are weighted using the inverse distance method and this information is used to estimate a particular block. (See Appendix 3 for Maptek's discussion on the resource method for BMK.)

On the estimated block model for Area A North, a Vulcan program script flags specific blocks that are indicated and inferred (IdIf) based upon the distances between the block center and samples. Any block within 200 feet of the sample sites is considered as indicated. Anything greater than 200 feet (200+) is inferred. The evaluation for Area A-South, which consists of only three RC holes, BMK-05-01, 02, and 03; almost all of South was flagged as an inferred estimate. The indicated and inferred categories are based on geologic and drilling density criteria. Tables 16 and 17 present the cutoff grade influence on the tonnages of the resource present above each cutoff limit in the oxidized and reduced zones and as a total for Area A that includes the North half of Area A alone and the combined North and South parts of Area A (See map - Figure 1B).

Figure 23-B is a plan view of a horizontal plane extending through the subsurface bedrock in Area A at an elevation of 6708 feet which happens to be near the redox boundary mostly in the reduced zone. This elevation point was located in each drill hole plotted on the map, and the value spread of the V_2O_5 assay in each hole was recorded in a certain color code, as shown in the legend, and recorded at each drill hole location. The mineralization values began with dark green indicating less than 0.1% V_2O_5 through lighter green indicating 0.2% and 0.3% grades.. The better mineralization grades begin with yellow representing 0.3% V_2O_5, light orange for 0.4% through dark orange at 1,0%. The color coded grades were extrapolated between the holes using the Maptek block model procedures. The absence of drill holes in the west half of the map indicates the lack of drill sample control for the block model to estimate grades.

The tonnages of mineralized rock are calculated using a tonnage factor of 13.5 ft^3/ton. This is a representative estimate of carbonaceous shale such as the Gibellini facies and equates to a density value of 0.074 short tons per cubic foot or 2.30 g/cm^3 (Waltham, 2004). Based on Waltham's text (Waltham, 2004) this tonnage factor is representative of the rock type that is the typical host for V_2O_5 mineralization at the Bisoni McKay. For more affirmation, the density number used for BMK agrees with the Gibellini's calculated density of 2.26 g/cm^3 for the reduced vanadiferous shale at the Gibellini Hill project, as noted in the April 2011 Technical Report of the Feasibility study (Hanson et al, 2011). The similarity of the reduced carbonaceous shale units from the same formation and age, the stratigraphic connection with about 8 miles apart, same basic composition and environment of deposition, and both bearing high values of vanadium lends credence that the densities should be similar. I have confidence that value for BMK is satisfactory.

Item 14.1 Methods

Data Verification

As QP I have reviewed the validation methods used by Maptek and agree with the procedures employed and the data calculation results as outlined below. The Vulcan program applied the

Inverse Distance Method to calculate resources. This is further discussed in Appendix 3. The overall grade of the block is calculated by weighting each sample grade found by the inverse of the squared distance of the sample from the centroid point. To help confirm the compilation results, the sample locations, grades and distances can be found and checked by hand using the Vulcan "Explain Tool" which is one of the techniques used to validate the model. Other techniques included running statistics (histograms, box plots) to validate the consistency of the data throughout the entire process, comparing results from raw drill hole data to composite points to the nearest neighbor, and selected inverse distance grade estimations by hand.

Item 14.2 Mineral Resource Base-case Cutoff

The plan for the 2007 phase of drilling in Area A has put the current exploration emphasis on a relatively small grid pattern to assess a block of mineralization for the parameters of continuity, grade characteristics, vanadium recovery expectations, geologic controls, and to complete a small block of indicated resource. Additional drilling will bring the inferred resource in Area A-South also to the indicated resource status. Stina will also continue subsurface exploration in Area A to expand the mineralized resource beyond the current drill grid.

Originally following the earlier CIM guidelines for the estimation of mineral resources (2003), the previous economic cutoff grades established for BMK in the earlier 2012 technical report were 0.2% and 0.3% V_2O_5 for both oxide and reduced mineralization. These derive, in part, from market conditions including the long term, forward, anticipated market for vanadium in the modern battery industry as well as continued use in the steel industry, coupled with fairly uncomplicated mining and metallurgical processing. Additionally the BMK deposit provides a new vanadium production source in the politically stable USA that is close to markets but short on native vanadium production. In North America mines producing vanadium as a primary commodity are rare; the most noteworthy is vanadium production from the sandstone uranium-vanadium deposits in southwest Colorado. Production will proceed by open pit mining versus more expensive underground mining. The mining methods will likely be similar to coal mining procedures because of the thickness and continuity of the mineralization and the relatively low to moderate hardness and friability of the host rock type. The property is located in a state and region favorable to mining with an experienced labor force within commuting distance. There are no identified sensitive environmental issues on or near the property, and the constituents of the mineralized rocks at the BMK project do not include unusual amounts of constituents that would be environmental red flags to complicate or seriously impede a mining operation. The metallurgical processes for vanadium recovery are standard practices for the industry. Stina plans additional research to improve vanadium recovery from BMK mineralization during the next work phase. See more discussion on the geologic rationale for the cutoff values in this section.

In the Stina April 2, 2012 news release the cutoff grades were set at 0.3% and 0.2% V_2O_5 for the lower limits of the bulk tonnage mining grade that were considered sufficiently conservative and economically realistic for mining at BMK property. The cutoffs from grades less than 0.3% to 0.1% would be considered weakly mineralized and would fall into the class of contained mineral content. However, in May 2014 the cutoff value was revised and to a single value, 0.2%, and the grades less than 0.2% to 0.1% are now weakly anomalous rock within the class of contained mineral content. The 0.2% cutoff will be considered the base case cutoff grade for the deposit. The

0.1% and 0.3% grades are useful points for making judgments on mineral trends because they can often be identified in the field rock. The 0.1% boundary indicating weakly mineralized rock and the 0.3% grade at a 0.3% cutoff indicates the possible onset of low grade mineralization in the 0.1% to 0.3% grade span, but still has value in the 0.2% grade.

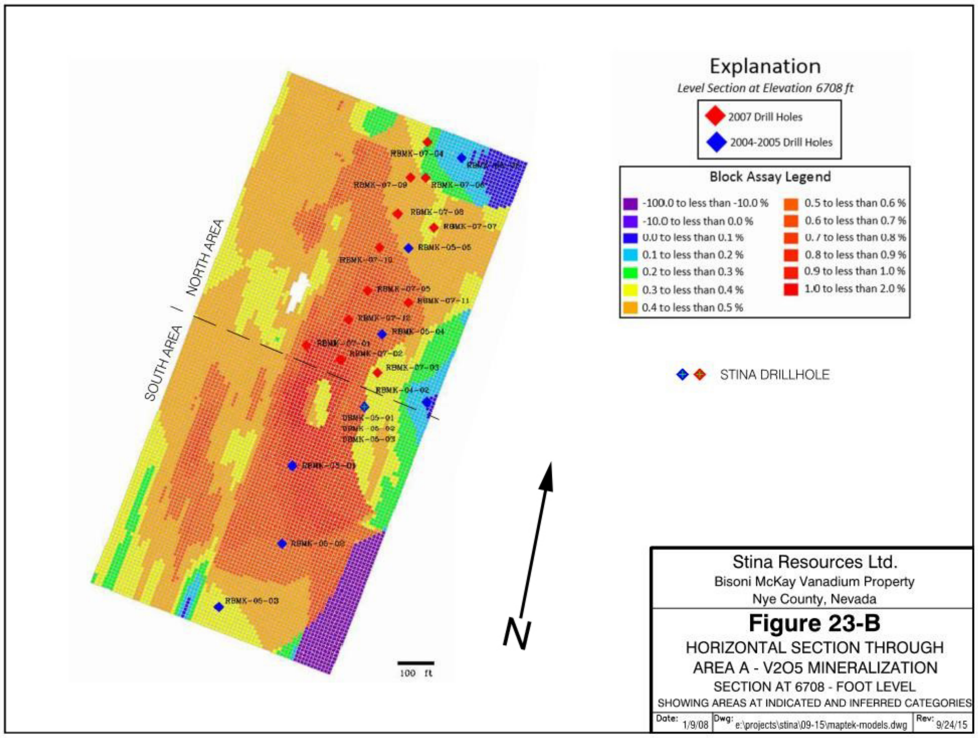
Lowering the cutoff grade to 0.2% was prompted by several factors. The BMK deposit is a stratabound, syngenetic deposit. The higher grades of vanadium collected in the shale during sediment deposition. The low-grade transition at the bottom of the reduced vanadium mineralization comes to an abrupt end as the collection mechanism for vanadium deposition ceased. The decline in V2O5 grade occurs with a few shale beds at the bottom of the mineralized zone. The change from mineralization to low-grade or non-mineralized material is usually an abrupt transition, and when mineralization values drop below 0.2% V2O5, succeeding grades will quickly decline within 5 to 10 feet into a section of low grade rock with grades usually ranging from 0.02% to 0.08%. The 0.2% grade is convenient natural grade cut-off at the bottom of the mineralized zone. The stratigraphic relationships suggest help signal that the bottom strata carrying higher-grade mineralization has been reached. If there are any short pulses a few feet thick of higher V2O5 grades, they will usually remain at high background levels below 0.2% in the category of contained mineral content. Using a cutoff of 0.3% would often leave some 0.2% mineralization behind that would be of interest.

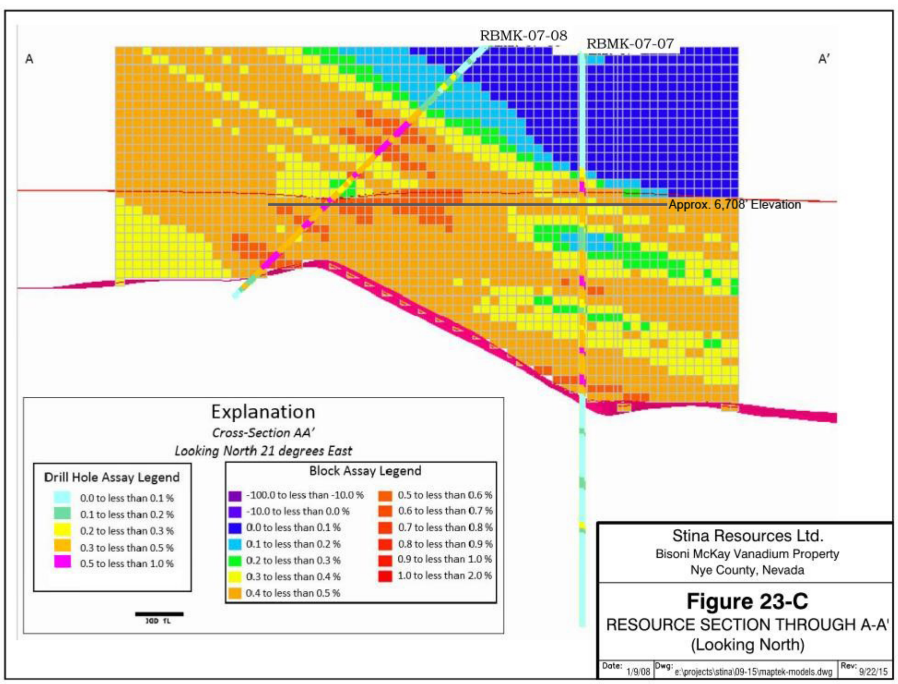
The V_2O_5 cutoff grades were set for American Vanadium's Gibellini Vanadium Prospect in their 2011 feasibility study (Hanson, 2011). The NI 43-101 Feasibility Study dated August 31, 2011 assigns V_2O_5 cutoffs of 0.08% for oxide mineralization 0.07% for transition, redox mineralization, and 0.09% for reduced mineralization for the Gibellini Hill deposit. The Gibellini mineralization (See Item 23) is geologically similar to Bisoni McKay's, except that oxide mineralization grades dominate the section and the reduced grades are much lower. At BMK reduced mineralization carries the dominant grades of interest. These low cutoffs at Gibellini help support the cutoff at BMK of 0.2%, which is a higher cutoff than that approved for the Gibellini Hill deposit

Further Discussion is found in Item 23.1 - Comparison of the Gibellini Hill and Bisoni McKay Vanadium Mineralization

Item 14.3 Field Criteria

In April-May of 2007 Stina selected Area A North for detailed drilling with twelve RC holes. In contrast to portions of Area B drilled in 2005, the vanadiferous trend in Area A has more of its stratigraphic mass intact and not broken and slivered by faulting as in Area B. The Area A holes were sited at appropriate intervals between the three borings completed in 2005 of Area A North. The spacing between all holes is approximately 100-110 feet. These are spread along two base lines 110 feet apart and include RC holes BMK 07-01 through 12 and RC BMK 05-04, 05, and 06 and the three core 2005 holes, DDH BMK 05-01 to 03 that were located at a common collar (Figures 6 and 23-A). The drill hole definition in this relatively limited area of the vanadiferous trend is considered sufficiently detailed for an indicated resource estimate.





Continuous samples, collected at five-foot intervals, provide a complete record of vanadium mineralization for each drill hole. See Table 9 and Tables 10A, 10B, 10C, 7A and 7C for grade comparisons between holes. The vanadium grade, and thickness continuity was consistent enough to give confidence for an inferred resource calculation between holes RC BMK 05-01, 02 and 03 in Area A-South (Tables 7B and 9). RC footage used in the resource estimation for Area A totaled 7,730 feet; the three core holes totaled 1,155 feet.

There is an elevation discrepancy between the field elevations from GPS readings and elevations from USGS topographic mapping. The error difference between the two surfaces ranged from about 5 feet to 25 feet. The GPS-plotted drill sites on resource profiles A-A', B-B', and C-C' (Figures 23-C, 23-D, and 23-E) fall below the mapped topography. The Vulcan program was calibrated to plot the data to the mapped surface. When the elevation discrepancy is corrected, it will not significantly modify the present grade estimation. The elevation error will be addressed again as part of the next phase of field work.

The indicated resource estimation is appropriate for the drilled portion of Area A North because of the following geologic factors.

- The confidence of vanadium grade continuity is supported by the data from infill holes drilled in the north half. There is dependable grade continuity between holes. The grades remain within the grade category between holes at 110-foot spacing intersecting reduced shale intervals.
- Enough holes have penetrated sufficiently thick sections of the reduced zone to the bottom of the significant mineralization to estimate an approximate thickness of the total contiguous package of indicated mineralization at the 0.2% and 0.3% cutoff grades).
- The grade and spatial character of the mineralization in the oxide zone are revealed.

Exploration is not sufficiently completed for a measured resource in the north half of Area A because of the following.

- The east, west sides and north end of the mineralization are not bounded with data.
- The dipping beds of the vanadiferous unit to east are not adequately mapped to explain mineralization depth variations between some drill holes.
- True width thickness estimations require additional confirming evidence.
- More grade data is needed for the very near surface mineralization in the upper five to ten feet. Perhaps this interval should be eliminated from a verifiable resource estimate.
- The nature of the structural factors effecting the disposition of the mineralized beds and intraformational juxtapositions on the west side of the north half are, as yet, uncertain.
- Additional duplicate samples should be collected and from a split in the field at regular intervals to confirm grades from the sample interval.

Item 14.4 Issues That Could Materially Affect Resource Estimates

Figure 23-B, the Horizontal Section, is a V_20_5 grade display, as calculated by Maptek, on a horizontal plane at the 6,708-foot elevation in the north and south halves of Area A. The grade data were collected from samples taken at puncture points through the horizontal plane. The intervening grades were interpolated using inverse distance and triangulation techniques. Most of the sample sites on the horizontal plane are in the reduced shale with a few samples in the redox

zone and very few at the bottom of the oxidized zone.

Figure 23-C is a cross section along the direction line connecting RC drill holes 07-07 and 07-08 that illustrates the V_20_5 grade variations in the Woodruff beds above and below the estimated redox trend and the horizontal plane (or horizontal section) as indicated by the red line. The east dipping shale beds are on the flank of the anticline shown on Figure 4; the exact position of redox line west of RC 07-08 is estimated at this time due to the lack of drill control. Note that the thick magenta-red trend line along the bottom of the section is the estimated boundary of the 0.2% V_20_5 cutoff.

The current drill holes in Area A North are east of the Woodruff/Webb fault contact and do not intersect the more severely deformed beds near the fault. Previous trenching near the fault zone reveals folding and local rupturing as the main fault zone is approached. The Woodruff beds carrying the V_20_5 mineralization near contact could be affected by the local tight folding and shearing along the fault zone. Additional drill holes west of the present line of holes will better define the grade distribution near the fault. Grade patterns shown in the western third of the Figure 23-B map should not be considered reliable data since there is no drill control there. These inferred grades are determined solely from Maptek's block modeling without any ground control verification. In this area there may be an advantage gained for mining since tight folding and local fault slivers could have compressed the vanadiferous beds. The vanadiferous beds may have piled up as folds and slivers resulting in a tight concentration of mineralized strata.

Because of the erratic, often strong leaching of vanadium from the upper few feet of the soil and rock regime, Stina's trench sampling data was not considered representative for resource assessment on Area A. The scattered crusts and impregnations of caliche deposits in the upper few feet in this zone (secondary $CaCO_3$ precipitated during arid soil formation processes) may interfere with vanadium recovery operations that could be a reason during mining to isolate and strip this layer as waste.

Based on the continuity of vanadium distribution found on Area A North, the analytical data from three drill holes on the south half were used to estimate an inferred resource estimate for the vanadiferous interval intersected (see Figure 1B, Figure 4, and 24-B).

An inferred resource assignment applies to the drilled portion of Area A-South because of the following.

- The mineralized shale in the south half has the same observed grade continuity characteristics as the north half that permit an inferred resource to be estimated from the wider spaced holes on the south half.

The current factors limiting the confidence to calculate an indicated or measured resource estimate at this time include:

- Additional drill control needed to the east in order to establish dips and thickness of mineralized beds,
- the existing hole depths lack corroboration of true thickness along the strike length due to insufficient penetration of the reduced mineralized strata (RC BMK 05-01 and 02),
- the east, west and south mineral extensions remain undefined at depth and corroboration is

needed for the presence or absence of structural disruption of the mineralized beds east and west sides of the trend.

Item 14.5 BMK Resource Assessment Discussion

Table 16 presents the data for the indicated-inferred resource block in Area A North. Table 17 shows the indicated and inferred data for the combined North and South parts of Area A. Figure 23-B shows the Vulcan calculated inferred and indicated resources, exposed on a horizontal plane at an elevation of 6,708 feet across the reduced zone. The subtotals in orange are the total tonnages for the each indicated and inferred mineralization category for each of the grade cutoffs of 0.2 and 0.3 V_2O_5. Note that the percentage loss of V_20_5 between cutoffs is lower in the reduced mineralization than in the oxide mineralization. Some of the vanadium was likely stripped during the weathering cycle that produced the oxidation zone.

Vulcan calculated indicated resources located on the north half of Area A. Because of the more sparse drilling density over Area A-South, this resource is entirely inferred for now. Table 16 presents indicated mineralized V_2O_5 grade/tonnages that fall into the 0.2% and 0.3% cutoff categories in the oxide and reduced zones at radius distances from the sampled holes from 0 to 200 feet. As discussed earlier, the indicated and inferred ranks, respectively, for Area A- North and Area A-South are based on demonstrated, overall confidence of grade continuity from geologic factors and drilling density within each of the blocks.

Cutting high grade samples for this estimate was not considered. The vanadium grade distributions are not strongly skewed because of high grades; the highest grade samples (above 1.0% V_2O_5) do not represent a significant amount of the total vanadium. The highest grade measured from a drill hole is 1.79% V_2O_5. A nugget effect is not expected nor indicated for this type of deposit.

The V_2O_5 cutoff grades of 0.2% and 0.3% help discriminate mineralization patterns, most notably in the reduced zone. The 0.2% cutoff identifies a band or apron of mineralization averaging 0.2% to less than 0.3% that occurs at the bottom of the reduced zone. As can be seen in Table 16 the difference between the indicated resource tonnage at the 0.2% cutoff and the tonnage at 0.3% V_2O_5 is about 1,627,000 tons in Area A-North.

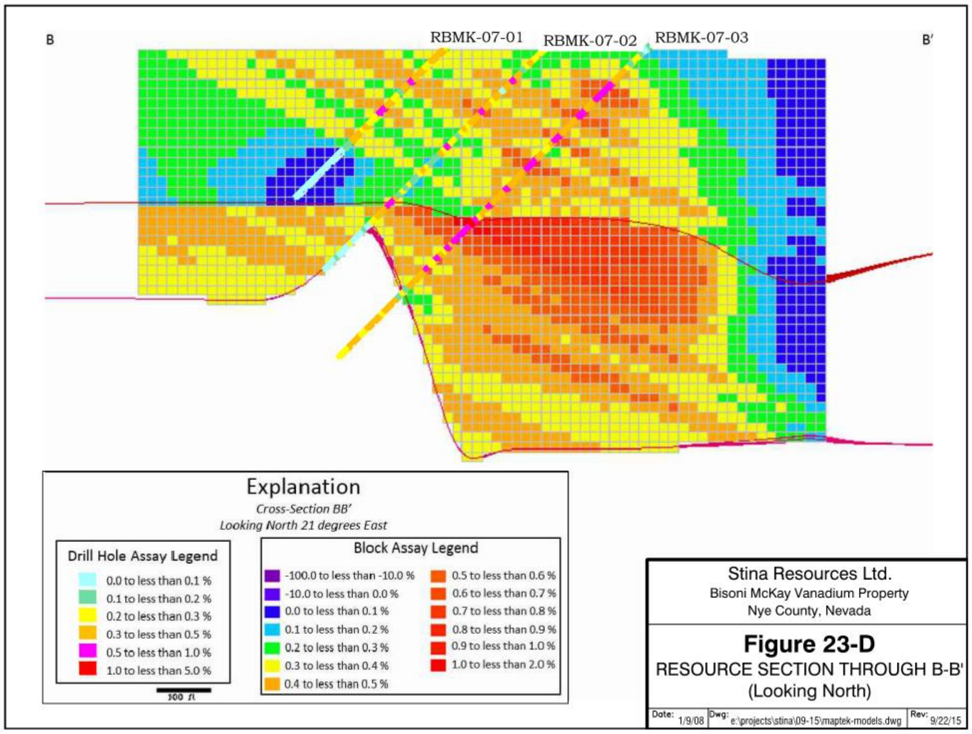
Some observations from the analytical data and the results of the 2015 resource calculations are as follows.

1) Tables 16 and 17 show the tonnage and average grades occurring in the 0.2% and 0.3% cutoff categories. The grade span in the 0.3% category ranges from 0.3% to 1.79% V_2O_5 with the majority of grades in most holes in the reduced zone ranging from 0.4% to 0.8%. The grades are averages of mineralized blocks calculated by the inverse method to adjust grade confidence to distance from the surrounding borings or sample points. The mineralization averages 0.47% in the reduced zone and 0.39% in the oxide zone within Vulcan's indicated and measured categories in Area A North.

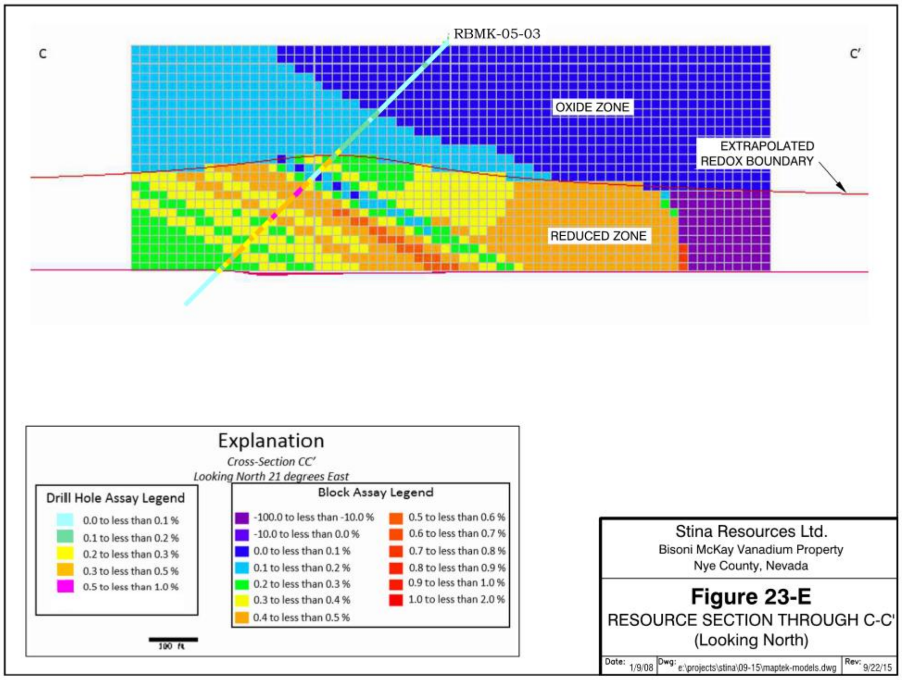
2) In Table 16 the indicated grade and tonnage resources above 0.2% and 0.3% cutoffs in the north half of Area A are recorded, and their spatial and numerical comparisons illustrate features

of the V_2O_5 deposition. In each oxide and reduced zone drilled, the higher grade 0.3% cutoff increments occupy the greatest tonnage in a thicker package of shale beds. By subtracting the 0.2% total indicated tonnage from the 0.3% tonnage in Table 16, it can be seen that the 0.2% to <0.3% grade and tonnage increment is only a quarter to a third that of the 0.3% increment. The dominance of grades above the 0.3% cutoff, especially in the reduced zone, is illustrated in the plan map and horizontal section-Figure 23-B and in the cross section-Figure 23-C (also see Item 14.3 Field Criteria) and in section profiles A-A, B-B', and C-C' (Resource sections; Figures 23-C, 23-D, and 23-E. Use the block assay legend for color code where the thick >0.3% vanadium-bearing bedded sequence in reddish hues (pale to brick red) is clearly outlined. As discussed above profiles A-A', B-B', and C-C also illustrate the relatively thin transition zone from high grade mineralization to weakly mineralized grades along the bottom contact of cutoff mineralization of the reduced zone. The red-magenta line is the estimated boundary of the 0.2% cutoff at the bottom of the anomalous mineralization. This rather abrupt change of the vanadium accumulation indicates that, during at a critical phase of shale deposition, V_2O_5% concentrations increased from background values of hundreds of ppm within a matter of a few feet of mudstone-shale accumulation to concentrations averaging greater than 0.2%, and those grades were sustained for a period of hundreds of feet of shale deposition, then quickly tapers off, and the V_2O_5 decreases to hundreds of ppm. The steep dip of the 0.2% line on the east side of the section is probably not as continuous as illustrated; the actual 0.2% contact has been degraded by local structural disruptions caused by the fault, such as tight folds, minor thrusts, etc, as seen in trenches near the fault zone. The time of greatest V_2O_5 accumulation had to be a period of optimal coincidence of physical and chemical conditions and V_2O_5 mobility in the basin as well as to the rate and nature of the organic accumulation.

As an exception, the 0.2% cutoff grade mineralization increases on the west side of profile B-B' (Figure 23-D) near the structural disturbance caused by the north-trending fault as discussed earlier (see also drill hole section - Figure 14). Data is lacking near the fault zone for a more confident resource assessment from the block model.



Note profile C-C' (Figure 23-E) plotted an essentially horizontal grade break that represents Vulcan's extrapolation of the grade difference across the redox boundary. The poor definition is due to the lack of corroborating drill hole data around RC BMK 05-03, mainly because it is the final drill hole at the south end of the line (see Figures 4 and 6).



The average V_2O_5 grades in two of the three RC holes, BMK 05-01 and 02 in the south half, are slightly higher than the RC holes in Area A North (see Table 17 and Table 9). It was mentioned earlier that the 2005 core holes, located directly north of holes 05-01 and 05-02, also have intersected higher V_2O_5 grades than the Area A North holes. Whether this may be part of a larger trend has not been established.

TABLE 16

Area A North - Base-Case Cutoff and Previous Cutoff, Average Grades and V2O5 Recovery Results

Grade Category		Redox State	0.2% V2O5 Base-case Cutoff Tonnage	Average Grade for 0.2% V2O5 Cutoff	0.3% V2O5 Previous Cutoff Tonnage	Average Grade for 0.3% V2O5 Cutoff
Indicated	0-200' distance between holes	Oxide	5,623,556.00	0.347	3,412,214.00	0.39
		Reduced	7,447,730.00	0.429	6,840,116.00	0.44
		Sub-Total	13,071,286.00		10,252,330.00	
Inferred	200'+ distance between holes	Oxide	773,522.00	0.374	679,468.00	0.39
		Reduced	521,468.00	0.378	473,082.00	0.39
		Sub-Total	1,294,990.00		1,152,550.00	

TABLE 17
Area A North and South Combined - Base Case Cutoff, Previous Cutoff, Average Grades and V2O5 Recovery Results

Grade Category		Redox State	0.2% V2O5 Base-case Cutoff Tonnage	Average Grade for 0.2% V2O5 Cutoff	0.3% V2O5 Previous Cutoff Tonnage	Average Grade for 0.3% V2O5 Cutoff
Indicated	0-200' distance between holes	Oxide	4,579,268.00	0.347	3,412,214.00	0.382
		Reduced	7,300,322.00	0.429	6,840,116.00	0.437
		Sub-Total	11,879,590.00		10,252,330.00	
Inferred	200'+ distance between holes	Oxide	2,893,104.00	0.324	1,725,532.00	0.374
		Reduced	4,154,952.00	0.498	3,876,712.00	0.515
		Sub-Total	7,048,056.00		5,602,244.00	

Table 18: Cutoffs, Average Grades and V_2O_5 Recovery Results (Hazen data)

Mineral Zone	Average Grade at 0.2% Cutoff	Average Grade at 0.3% Cutoff	lbs V_2O_5 at >0.2%	lbs V_2O_5 at >0.3%	Percent Recovery After Processing ,	Extraction Method
Oxide	0.36%	0.39%	7.2 lbs/t	7.8 lbs/t	>90%	AP
Reduced	0.42%	0.47%	8.4 lbs/t	9.4 lbs/t	74%	SRL

Extraction Methods: AP – acid pugging, curing, leaching;
SRL - salt roasting and leaching

ITEM 15 - MINERAL RESERVE ESTIMATES

There are no mineral reserves established at this time.

ITEM 16 – MINING METHODS

Mining method alternatives have not been studied

ITEM 17 – RECOVERY METHODS

At this stage of the project, recovery method alternatives have not been firmly established, but preliminary recovery studies have been initiated.

ITEM 18 – PROJECT INFRASTRUCTURE

Project Infrastructure has not been studied at this time.

ITEM 19 – MARKET STUDIES AND CONTRACTS

Market studies have not been initiated

ITEM 20 – ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

None of these have been addressed at this time.

ITEM 21 – CAPITAL AND OPERATING COSTS

Cost estimates for mine development, mining, mineral extraction and other activities related to production have not been established.

ITEM 22 – ECONOMIC ANALYSIS

As yet there has been no systematic economic analysis of the property.

ITEM 23 - ADJACENT PROPERTIES

Two neighboring vanadium-bearing deposits near BMK, the Gibellini and Bisoni prospects, also occur in the carbonaceous black shale facies of the Woodruff Fm along the east side of the Fish Creek Range north of the Bisoni McKay property. The Gibellini deposit is discussed in Item 23.1 of this report. Gibellini and Bisoni are located in Eureka County, and BMK is in Nye, very near the county line. (See Figure 1 for map). The BMK, Bisoni, and Gibellini deposits comprise the Central Nevada Vanadium Belt. The field relationships gathered from private exploration efforts and USGS studies indicate that the basic geology, mineralization, and the geologic evolution of the three deposits are similar including being hosted by the same Devonian Formation and member, but each site has its own local deformation personality.

Gibellini Hill Deposit

The Gibellini property is about 8 miles north of BMK. Detailed information exists from recent exploration effort on Gibellini Hill A at BMK, the Gibellini and Bisoni prospects have oxidized and transition alteration zones from weathering overlying organic, reduced shale (JAA, 1988). The American Vanadium Corp. under their wholly-owned subsidiary AMEC Americas Limited (AMEC), has aggressively explored and evaluated the Gibellini property over the last few years, especially the Gibellini Hill deposit and, to a lesser extent, the Louie Hill mineralization. In 2011 they completed the NI 43-101 Technical Report of the Feasibility Study (2011) on the Gibellini

Hill mineralization. The Gibellini Hill deposit has received most of historic and recent exploration and expenditures of the three vanadium prospects since 1946. The geology of the Gibellini deposit is further discussed in Item 14.4 and Item 23.1 (below).

The organic shale of the Gibellini facies at the Gibellini prospect reportedly contains up to 0.4% V_2O_5 as well as up to 0.12% Ni, and 1.8% Zn (Lechler and Hsu 1989) and anomalous copper, nickel, molybdenum and manganese and platinum group elements. None are considered economic. However the base metal anomalies are unique when compared with the typically unremarkable concentrations that are found at BMK (Desborough et al, 1984). The geologic consensus is that they all are likely syngenetic as is vanadium

The Gibellini and Bisoni McKay deposits appear to have formed under similar conditions during Woodruff deposition. The metals may occur in organic complexes, as fine sulfides, with manganese oxides. Lechler and Hsu report sphalerite, organic vanadium complexes, nickel organic complexes and molybdenite. Anomalous platinum group elements ("PGE") are also present as unidentified phases.

On January 11, 2016, American Vanadium Corp, announced it had entered into a letter of intent with DMG Mori to acquire their wholly owned subsidiary, Gildemeister Energy Storage GmbH, the manufacturer of the CellCube vanadium flow energy storage system. American Vanadium has also applied for a change of business and intends to fully enter the vanadium industry. CellCube has been producing VFR battery systems for over 15 years, has installed over 100 industrial batteries, and is advancing worldwide installation.

Item 23.1 - Comparison of the Gibellini Hill and Bisoni McKay Vanadium Mineralization

The geologic conditions, mineralogy, and the environment of sediment and vanadium deposition for Bisoni McKay and Gibellini Hill are very similar, and the study of one can benefit the understanding of the other. Similarities include that primary mineralization in both are syngenetic, are conformable to bedding, occur in Woodruff carboniferous shale, have good continuity in thickness and the grades and the timing of vanadium deposition for both deposits were likely close. Both have a similar oxide alteration blanket from deep surface weathering that has resulted in a prominent oxidized blanket over a reduced zone, and an intervening transition zone. Both sites may have formed along a particular deposition control for heavy metals, including vanadium in the Devonian basin. Similar depositional conditions have likely occurred for the Bisoni prospects. It appears that favorable conditions for vanadium deposition must have been available over narrow intervals along the span of the Central Nevada Vanadium Belt during deposition of the Woodruff Fm.

An important contrast between BMK and Gibellini Hill is that the host rock of greatest potential at BMK is the reduced shale with higher V grades and a thick drilled section of 300 feet or more of mineralization. This contrasts with mineralization at Gibellini Hill where the higher grades of vanadium occur in the oxidized shale beds. In oxide zone carrying vanadium at Gibellini is thicker and the oxide mineralization is more consistent than the oxide mineralization at BMK. The reduced mineralization at BMK carries significantly higher grades than either the oxide or reduced zones at Gibellini (see Tables 16 and 17, this report).

The potential at Gibellini Hill is also limited because the mineralized beds are part of a shallow thrust block; the faulting has left part of the lower Woodruff Fm and its vanadium strata behind.

The actual area of mineralized shale has been reduced, at least for the Gibellini Hill portion of the property, and the known depth of the mineable mineralization is limited.

The mineralized Woodruff Fm shale at Gibellini Hill contains up to 0.4% V_2O_5 as well as up to 0.12% Ni, and 1.8% Zn (Lechler and Hsu 1989) and anomalous copper, molybdenum and manganese and platinum group elements (See Table 15). The Gibellini and Bisoni McKay deposits appear to have formed under similar conditions during Woodruff deposition. However, the elevated base metal anomalies at Gibellini Hill are unique when compared with the typically unremarkable concentrations of them at BMK except for the elevated levels of some zinc intervals. None of the grades are considered economic.

Table 15

Secondary Vanadium & Phosphate Minerals at Gibellini

Schoderite, metaschroderite	-	$2Al_2O_3; V_2O_5 . P_2O_5 . 1\ 6H_2O$
Vashegyite	-	$(Al_4(PO_4)_3 . (OH)_3 . n(H_2O))$
Metahewettite	-	$CaV_6O_{16}\ 3H_2O$
Wavellite	-	$2AlPO_4 . Al . (F . OH)_3\ 5H_2O$
Bokite	-	$Kal_3Fe_6V_{26}O_{76} . 3OH_2O$

In contrast to BMKs exploration program, the exploration effort at American Vanadium's Gibellini has been far more intense, especially over the last few years. Since 2007 American Vanadium has drilled 10,820 feet of RC drilling and 4,061 feet of core on their Gibellini Hill property. Also, legacy drilling by other exploration companies from 1964 through 1989 completed nearly 20,500 feet of rotary and RC drill holes, and some of the their drilling data has been used to advance the recent exploration effort. Other progress includes the development of recovery methods, mineral processing and other details required for the feasibility study. In contrast BMK is still in the early exploration stage with only 15 drill holes in Area A that are appropriate for calculation an indicated resource.

Bisoni Prospect

The Bisoni vanadium prospects are located between the BMK and Gibellini prospects, about 5 miles due north of BMK.. The mineralization is similar to that found at the Bisoni McKay Property. It is described as occurring in sheared and contorted black shale of the Woodruff Fm. The property was explored by the Union Carbide Nuclear Co. (UCNC) in 1958 and 1959 (Davis and Ashizawa, 1959; Davidson and Lakin, 1961a, 1961b; Hausen, 1960). The black shale is inter-layered with bedded chert and calcareous shale and a little limestone. The highest historic grade at Bisoni was reported at 0.4% V_2O_5. The scattering of Bisoni vanadium prospects are found from about 3 to 5 miles due north of BMK. The author is not aware of any recent exploration on the site.

Further details on the Bisoni Property are contained in Morgan (1989). Morgan describes the mineral claims, their history, location, regional geology, prospect geology, and mineralization.

ITEM 24 - OTHER RELEVANT DATA AND INFORMATION

No further comments.

ITEM 25 - INTERPRETATION AND CONCLUSIONS

Item 25.1 Area A

The following interpretations and conclusions refer to both halves of Area A (Figures 4 and 24 and drill hole sections). Much of the earlier structural interpretations and current stratigraphy mapping by Hose, 1983 will be open for redefinition on the BMK property when the new USGS mapping by Poole and Sandberg is open to the public. Targeting and interpreting V_2O_5 trends will be given a better chance with a better view of BMK.

- In Area A the pattern of holes from the combined 2007 and 2005 drilling as well as logs from the historical Hecla holes have confirmed a thick, contiguous facies of stratabound and strataform vanadium mineralization within a persistent kerogen-rich carbonaceous shale that strikes northward through Area A. The 2007 drilling reasonably confirms the continuous grades of interest ranging from 0.2% to a maximum of 1.79% V_2O_5 along strike and down dip for the 800-foot length of Area A North as well as being reasonably established for an equivalent distance in Area A South. The similar grade ranges, general mineralization characteristics, and host rock characteristics between the mineralization intercepts in the north half and south halves of Area A (also in Area B holes) generates a satisfactory level of confidence to assess future mineral resources and resource estimations at hole spacings between 100 and 200 feet, barring local structural disturbances or facies changes that would require greater detail for confident prediction of the mineralization.
- Vanadium has been partially leached from the oxidized zone, but significant grades and thicknesses remain for a mining resource. The vertical depth of the oxidation averages about 180 feet with a typical abrupt increase in grade below the redox boundary in most holes. The cuttings and core analyses reveal anomalous grade surges of 50% to 150% of V_2O_5 up to 35 feet thick immediately below the redox zone that likely is due to supergene enrichment processes. The grades above and below the elevated zone drop back to an average equivalent for the rest of the mineralized interval (Table 5). However, at present, these elevated zones are too inconsistent to expect a broad dependable grade of vanadium enrichment throughout the Area. At present these grade pulses will be treated as normal local grade variations for resource calculations.
- To date the true thickness estimations of the package of contiguous vanadium-enriched beds with grades exceeding 0.3% range from 250 feet to 300 feet in Area A. Not all drill holes in mineralization have penetrated to the bottom of the economic mineralization.
- The three 2005 RC holes and three 2005 core holes and the twelve 2007 RC infill holes yielded sufficient data to produce an indicated resource inventory on the drill grid in Area A North using the indicated category (Table 16). Here the indicated resource estimate of combined reduced and oxide mineralization at the 0.2% cutoff totals 11,879,590 tons at 0.39% V_2O_5.

- Based on the good continuity of vanadium mineralization in the north half, an inferred resource inventory for reduced mineralization was calculated in Area A North and South combined for the drilled portion of the extension of the vanadiferous beds using data from the three RC 2005 borings spaced at 213 feet apart for the south half. The inferred resource at the 0.2% cutoff is 7,048,056 tons of 0.42% V_2O_5 which includes adding the reduced and oxide lithologies found in Table 17. In the north half alone the inferred resource is 1,258,158 tons at 0.37% V_2O_5 from adding the reduced and oxide lithologies within a 0.2% cutoff, found in Table 16).
- The continuity of mineralization at 0.2% cutoff along the three dimensions of the mineralized stratigraphic block is illustrated on the plan slice maps, Figures 23-B and 23-C, and sections on Figures 23-D, 23-E and 23-F. Figure 23-C is taken from the horizontal section spanning the calculated mineralized area at the 6,708-foot elevation plane showing most of the redox interface within the reduced zone at this location. On this drawing the estimated east and west boundaries of the 0.2% cutoff mineralization are extrapolations from projections from drill hole logs and down-hole vanadium assays of the Woodruff strata. The holes sites are the puncture points for each bearing on the horizontal plane.
- The length of the vanadium trend estimated for resources through the north and south halves of Area A exceeds 1,600 feet of strike length and up to 525 vertical feet, down dip. The actual stratigraphic thickness of the vanadium-bearing unit is estimated to be about 250 to 300 feet. (Defining key beds to estimate dips and thicknesses between RC holes is difficult here). Geologic evidence and historic Hecla trenching and drilling supports the existence of additional mineralized rock north and south of the present limits of Stina exploration in Area A.
- The down-dip side (east side) of the vanadium trend remains without drill definition and may be spatially limited to the east by Devils Gate Limestone fault block outcrop on Area A-South (Figure 4). On the north half the limestone outcrop is concealed and the down-dip extent of the beds can only be speculated at this time.
- On the west side of the trend, the Woodruff shale is in visible contact with the Devils Gate Limestone outcrop in the south half (Figure 4). Beyond the north end of the limestone outcrop (Figure 4) the Devils Gate plunges below the surface and the Woodruff Formation may be folded over the limestone and in contact with the fault bounding the west side of the limestone outcrop. Shale dips in the west end of Trenches 24 and 25 are steep and some appear overturned suggesting that an asymmetric anticline may exist along the fault line. The mineralized zone along the fault has yet to be defined by drilling. If overturned, the vanadiferous beds on the west limb may dip steeply east and remain an accessible resource.
- On the west side of the fault at the vicinity of the Area A-north drill holes, the rocks are identified as the Mississippian Webb Fm, and they occur stratigraphically above the Devonian Woodruff Fm. The sandy-shaly Webb has been faulted down next to the Woodruff in Area A-North along the Woodruff/Webb fault. This situation provides a good target for the possibility of additional vanadium mineralization in the Gibellini facies under the Webb if the depth to mineralization under the Webb is reasonably accessible to drill and mine. The revised USGS geology map of the BMK area may generate more evidence for an expansion of the vanadium mineralization in Area A.
- Of the four vanadium extraction methods tested, two methods successfully recovered

acceptable percentages from the Bisoni McKay vanadium enrichment zone (Table 18). Both “magnetic separation” and “direct leaching” by acid and alkaline lixiviants had unacceptable recoveries. The “acid pugging, curing and leaching” method produced greater than 90% V recovery from oxidized mineralization but less than 60% from reduced mineralization. The “salt roasting and leaching” method recovered 74% V from the carbonaceous (reduced) and 70% from transition mineralization. Hazen believes the recovery procedures are not yet optimized to their fullest recovery potential.

- Much of the geologic structure in the vicinity of Area A has yet to be worked out by Stina staff to better interpret the extent of the potentially mineralized units. There is little confidence in the USGS 1980s map-view of the BMK property. A new USGS map is expected to provide better information to further interpret the extent of the vanadium mineralization.

Item 25.2 Area B and C

In Area B the evidence from the 2005 Stina RC and DDH holes and historic Hecla holes indicate that faulting has disrupted and fragmented the Woodruff Formation and put the vanadiferous beds in juxtaposition with Devils Gate Limestone in patterns which have yet to be completely understood (Figure 5). Here the Woodruff shale is bounded on the east and west by older rocks in a fault block or graben-like setting. Both sets of holes reveal the shale section is close to or rests against the Devils Gate Limestone thus limiting the width of the mineralized zone between the limestone walls on either side. The contact relationships are uncertain, but broken rock encountered in some of the borings indicates a fault contact. Also, outcrop evidence reveals that the vanadiferous beds project under the older Devils Gate Limestone on the west side of Area B. This suggests fault geometry such as a thrust plate, thrust slivers, or slide blocks. Some of the Devils Gate Limestone dip attitudes on the west side outcrops appear to be overturned also indicating a possible dynamic rather than a passive structural event. The thickness and average mineralization grades of the vanadiferous unit intersected by the eastern line of Hecla’s RC holes in Area A is typically less than Area A, but the thickness and grades improve in the line of Stina and Hecla holes on the west side of the fault block structure. The relatively thin sequence of lower grades intersected by the former Hecla borings has not been explained; BMK has not explored there. Because the exploration in Area B thus far suggests potential for smaller, more irregular tonnage in the explored parts, further exploration here may be deferred until a future phase of work when the structural setting is better understood. At the south side of Area B, Willow Creek drainage has likely been controlled by a lateral fault has shifted the Woodruff Fm and other Paleozoic rocks left laterally. Another future drilling program is planned to explore the Woodruff trend south of Willow Creek. A historic drill hole is reported to have intersected vanadium in this area.

Stina has not yet completed an initial assessment of the vanadium trend in Area C and the property between Areas B and C at the southern end of the BMK vanadium trend (Figure 3). Surface evidence from outcrops in old pre-Stina trenches carry surface oxidized Woodruff shale with scattered showings of vanadium secondaries. Further evidence from Hecla drill hole 4 shows V_20_5 mineralization in reduced, black shale with grades comparable to those in Area A. The drill hole remained in mineralization to total depth at nearly 300 feet.

Item 25.3 Mineral Processing

The scoping level study undertaken by Hazen Research Inc., demonstrated that a technically viable process consisting of oxidizing roast (and potentially a salt roast) followed by acid pugging, curing and leaching, with concentrated sulfuric acid, will provide good vanadium extraction from all three vanadium containing samples studied. The technical assessment of the laboratory results indicates contrary information between the mineralogy of the three composite samples and the high sulfuric acid consumptions. Additional laboratory studies are required to determine the necessary acid consumptions for the leaching process.

ITEM 26 - RECOMMENDATIONS

Item 26.1 Phase III Metallurgical and Mineral Processing Tests

Phase II is now complete. The ultimate aim of the Phase III program is to develop a resource inventory, with a satisfactory metallurgical recovery, over a significant part of the vanadiferous trend that will justify a preliminary assessment report. At this time the planning and expenditures for extending a Phase III exploration phase are contingent on results of forthcoming Phase III metallurgical test results, for optimizing V_2O_5 recovery. At this time an initial estimate budget of $150,000 CAD has been assigned but may be adjusted upwards or downwards as further results are received.

There are no further field exploration programs planned during Phase III. Exploration would continue as Phase IV activities, and the extent of that program would be contingent on the outcome of the metallurgical studies and vanadium recovery test results.

The Phase III metallurgical studies will necessarily address the vanadium recovery issue. Further metallurgical test work should be performed to determine if the proposed flowsheet can be optimized. A systematic metallurgical study should be undertaken in order to generate data for the Preliminary Economic Assessment of the project. This would include collection of new composite samples and test work for crushing, grinding, roasting, leaching and concentration of the vanadium values into a marketable product. Due to the high levels of organic carbon, a process that concentrates the carbon followed by total oxidization of the organic carbon and then leaching of the oxidized material may further reduce capital and operating costs. The new composite samples should represent the three mineralized zones recognized as Oxide, Transition and Reduced, corresponding to the three zones studied in the previous Hazen Research work.

The budget for the Phase III lab work cannot be fully established until costs are estimated for the critical bench test phase by the new metallurgists, but an initial estimate budget of $150,000 CAD has been set and will be adjusted as initial Phase III results are received. Follow-up Phase III drilling to expand the area of resources in Area A will continue after metallurgical recovery tests give a better indication of economic recoverability of vanadium. The Phase II work is completed with this report and any remaining budget funds will be added to the Phase III program.

Item 26.2 Budget Projection

Table 19 shows the projected budget for the metallurgical tests.

The next phase of metallurgical studies would concentrate on reducing the acid consumption observed in the Hazen Research Inc. studies, as well as generating data needed for the preliminary economical evaluation of a process that can treat material from all three mineralized zones. Following the metallurgical research test work on the project, additional drilling should take a significant portion of the vanadium trend in the Area A test area into the indicated or measured resource category as well as include additional mineralization as inferred resource and/or as a newly discovered extension of the mineralization.

TABLE 19: PROJECTED BUDGET FOR PHASE III OF PRELIMINARY ECONOMIC ASSESSMENT PROGRAM

Expense Categories	$ Amount	
Metallurgy Studies	$75,000	
Mineral Process Engineering	$40,385	
Grand Total	**$115,385**	US$
Exchange rate 1.30%	**$150,000**	CAN$

ITEM 27 - REFERENCES

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ITEM 23.2 - Misc. Maps and Charts used in older technical reposts

(i) Property Map. Gibellini Project, Eureka County, Nevada. Noranda Exploration. Paper Copy. 2000 feet to 1 inch. (February 1973.)

(ii) Gibellini Vanadium Prospect, Eureka County, Nevada. T 15N, R52E. Tertling Drill, Cheshire Drill and additional Drill Holes, Trench Locations, Claim Corners, Bench Marks and Survey Markers. A Paper Copy of the Original by Duval Corporation. 100 feet to 1 inch. January 1982.

(iii) Inter Globe Resources Drill Hole Location Map. Gibellini Project (Mylar) 100 feet to 1 inch. After Noranda 1973 by Olympus Aerial Surveys Inc. 1987.

(iv) Inter Globe Resources Drill Hole Location Map with approximate location of Trial Pits and Trenches added by hand (paper print). Gibellini Project (Mylar) 100 feet to 1 inch. After Noranda Inc. (1973) by Olympus Aerial Surveys Inc. 1987.

(v) Map of Lode Mining Claims Township 15 and 16N, Range 52E. Mount Diablo Meridian, Eureka County, Nevada for Rocky Mountain Surveyors Inc. 2000 feet to 1 inch., June 1989.

(vi) Fish Creek Range Mineral Claims. Three Paper Copies. 2000 feet to 1 inch. Faxed To? From? July 1989.

(vii) Comparison of Drill Bids for Gibellini Metallurgical Drilling. (James Askew Associates, Inc., 1989).

(viii) Bulldozer Trench BT 8. Gibellini Vanadium Project, Eureka Project, Nevada. Rib maps. 10 feet to 1 inch. James Askew Associates, Inc. (1989).

(ix) Bulldozer Trench BT 9. Gibellini Vanadium Project, Eureka Project, Nevada. Rib maps. 10 feet to 1 inch. James Askew Associates, Inc. (1989).

(x) Assay Map. Gibellini Manganese, Zinc, Nickel Mine. US Bureau of Mines Project No. 373. Scale 20 feet to 1 inch. Paper Copy. (Undated).

Technical Report dated this 29th day of August, 2016.

Edwin Ullmer

APPENDIX 1

ACTIVE CLAIMS

Admin State: NV
Geo State: NV

STINA RESOURCES NEVADA LTD
10-8331 RIVER RD
RICHMOND, BC V6X 1-Y1

CUSTOMER ID: 2288819

Serial No.	Claim Name/Number	Lead Serial No.	Disposition
NMC728070	JEANETTE #1	NMC728069	ACTIVE
NMC728081	NAN #1	NMC728069	ACTIVE
NMC728082	NAN #2	NMC728069	ACTIVE
NMC728083	NAN #3	NMC728069	ACTIVE
NMC728084	NAN #4	NMC728069	ACTIVE
NMC728085	NAN #5	NMC728069	ACTIVE
NMC728086	KITTY #4	NMC728069	ACTIVE
NMC797108	JEANETTE	NMC797097	ACTIVE
NMC797109	JEANETTE 2	NMC797097	ACTIVE
NMC797110	JEANETTE 3	NMC797097	ACTIVE
NMC797111	WILLOW 28	NMC797097	ACTIVE
NMC797112	WILLOW 27	NMC797097	ACTIVE
NMC797113	WILLOW 30	NMC797097	ACTIVE
NMC797114	WILLOW 31	NMC797097	ACTIVE
NMC797115	WILLOW 12	NMC797097	ACTIVE
NMC797116	WILLOW 14	NMC797097	ACTIVE
NMC797117	WILLOW 13	NMC797097	ACTIVE
NMC797118	WILLOW 15	NMC797097	ACTIVE
NMC797119	WILLOW 17	NMC797097	ACTIVE
NMC905366	GINSU 1	NMC905366	ACTIVE
NMC905367	GINSU 2	NMC905366	ACTIVE
NMC905368	GINSU 3	NMC905366	ACTIVE
NMC905369	GINSU 4	NMC905366	ACTIVE
NMC905370	GINSU 5	NMC905366	ACTIVE
NMC905371	GINSU 6	NMC905366	ACTIVE
NMC905372	GINSU 7	NMC905366	ACTIVE
NMC905373	GINSU 8	NMC905366	ACTIVE
NMC905374	GINSU 9	NMC905366	ACTIVE
NMC905375	GINSU 10	NMC905366	ACTIVE
NMC905376	GINSU 11	NMC905366	ACTIVE
NMC905377	GINSU 12	NMC905366	ACTIVE
NMC905378	GINSU 13	NMC905366	ACTIVE
NMC905379	GINSU 14	NMC905366	ACTIVE
NMC905380	GINSU 15	NMC905366	ACTIVE
NMC905381	GINSU 16	NMC905366	ACTIVE
NMC905382	GINSU 17	NMC905366	ACTIVE
NMC905383	GINSU 18	NMC905366	ACTIVE

Number of ACTIVE cases: 37

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

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Agency Tracking ID :	1472162056
Transaction Date :	2016-08-25
Transaction Amount :	$5735.00
Number of claim(s) :	37
Lead Serial Number :	NMC797117
Cost Center State :	NV

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APPENDIX 2

HAZEN RESEARCH, INC.

4601 Indiana Street • Golden, Colorado 80403 USA
Phone: (303) 279-4501 • Fax: (303) 278-1528
www.hazenresearch.com

APPENDIX 2 – HAZEN VANADIUM RECOVERY REPORT

Mr. Jim Wall
General Manager
Stina Resources, Ltd.
c/o Northern Seas
Suite 10, 8331 River Rd.
Richmond, BC V6X 1Y1
Canada

Subject: Vanadium Extraction Experiments on Bisoni–McKay Ore Samples
Hazen Project 10407

Dear Mr. Wall:

The following is our report on an experimental program to extract vanadium from Bisoni–McKay ore.

INTRODUCTION

At the Bisoni–McKay property, vanadium-bearing shale has been classified into three ore types: oxide, transition, and carbonaceous. The near-surface oxide ore is relatively free of carbonaceous material. Found at some depth, carbonaceous ore contains a substantial amount of organic carbon (several percent), and transition ore is from a zone in which oxidized material grades into carbonaceous material. Hazen Research, Inc. was asked by Stina Resources to examine potentially suitable processing options for extracting the vanadium from the shale in a bench-scale experimental program. The focus of the work was directed at the front end of an overall process flowsheet—that is, determining what is required to bring the vanadium into solution in order to separate it from the host (gangue) minerals.

Guided by a mineralogical characterization of the ore types, the experimental program consisted of four parts:

- Experiments on all ore types to physically concentrate the vanadium by magnetic separation.
- Direct leaching of oxidized zone ore with three lixiviants.
- Acid pugging and curing on all ore types, followed by leaching.
- Roasting of carbonaceous and transition ore followed by leaching.

The remainder of this report describes the experimental work, as well as recommendations for additional experimental work for continued process flowsheet development.

SUMMARY

1. Because a substantial fraction of the vanadium is associated with iron oxides in the ore, physical upgrading was attempted using wet and dry high-intensity magnetic separation. Some magnetic products assaying over 1% V were produced, but the best-case vanadium recovery was 35% and the nonmagnetics assayed 0.2% V or greater.

2. Direct leaching of the pulverized, oxidized ore was tried with three leaching solutions: dilute H_2SO_4, dilute acid containing SO_2 (a reducing agent), and Na_2CO_3 solution. The best vanadium extractions were 33%, 54%, and 14%, respectively.

3. An acid pugging–curing and leaching procedure was tried on all three ore types. In this process, dry-ground ore is intimately mixed with water and concentrated H_2SO_4 and allowed to "cure" at a temperature of 110–150°C for several hours. After curing, the material is water leached to dissolve the vanadium. The best-case result for the oxidized ore was a 95% V extraction using an acid dose of 192 lb/st. Vanadium extraction results for the transition and carbonaceous ores were lower at 56% and 50%, respectively.

4. Because a significant fraction of the contained vanadium is associated with organic matter in the carbonaceous and transition ores, an oxidizing roast followed by salt roasting and leaching was tried. The best vanadium extractions were 74% for the carbonaceous ore and 70% for the transition ore.

CONCLUSIONS

1. The vanadium was associated with the ferric oxide in the oxidized zone ore and with both ferric oxide and the carbonaceous matter in the carbonaceous and transition ores.

2. Although some concentration of vanadium was demonstrated in magnetic separation experiments, the overall vanadium recovery was low.

3. Direct leaching of the pulverized, oxidized ore with three leaching solutions—dilute H_2SO_4, dilute acid containing SO_2, and Na_2CO_3 solution–resulted in relatively low vanadium extractions.

4. For the oxidized ore, the acid pugging–curing processing method was effective in extracting a high percentage of the contained vanadium. This approach was less effective on the carbonaceous and transition ores. There are a number of variables in the acid pugging–curing process, and the results presented are probably not optimized; therefore, it is likely that some improvements can be made in terms of reducing reagent consumptions, shortening residence times, and eliminating some steps while retaining the same or better vanadium extractions.

5. An oxidizing roast with air followed by salt roasting and leaching effectively extracted the vanadium from the carbonaceous and transition ores. The percent vanadium extractions obtained are within a range expected for the salt roasting process. As in the case of the acid pugging–curing, only a limited number of experiments have been conducted and there are several variables involved. The process is probably not optimized.

RECOMMENDATIONS

1. Due to the low recovery obtained by magnetic separation, the further development of this process option is not recommended.

2. To better define and optimize the acid pugging–curing process for oxidized ore (and possibly transition and carbonaceous), additional experiments are recommended. Variables to be investigated should include acid and water dose, curing temperature and time, and grind size.

3. Similarly, the roasting–leaching process can likely be optimized by conducting additional bench-scale experiments such as examining salt-roasting temperature and grinding requirements on both or all three ore types, investigating the roasting and leaching residence times, and trying a single-stage leach with acid instead of two leaching stages. An experiment in which an oxidizing roast is followed by acid pugging and water leaching is also recommended.

ORE SAMPLES

Drill hole samples (twelve 5-gal buckets) were received for use in the experimental program. A description of the samples is provided in Appendix A. Samples from a given zone of each drill hole were crushed to minus 10 mesh and combined. A representative 1-kg split was then taken from each zone. The process was repeated for the other holes. Finally, the 1-kg zone splits from each hole were combined (on an equal mass basis) to produce composites for each zone type. From each zone composite, a split was removed and pulverized to produce assay pulps for head analyses. The composites were used in the experimental work. The head assay results are reported in Table 1.

Table 1. Head Assays Results for Zone Composites

Ore Zone	Assay, wt%					
	CO_2 as C	C_{tot}	C_{org}	V	S_{tot}	Fe
Oxidized Zone	0.06	0.48	0.42	0.30	0.05	0.85
Transition Zone	0.27	3.6	3.3	0.26	0.44	0.80
Carbonaceous Zone	0.31	8.7	8.3	0.30	1.66	0.88

In addition to the assay results shown above, an x-ray fluorescence (XRF) scan (semiquantitative analysis) was performed on each composite; the results are included in Appendix B. The ore samples were relatively low in carbonate.

Occurrence of the Vanadium in the Ore Samples

Splits of each ore zone composite were examined microscopically and with an electron microprobe to determine how the vanadium is present in the ore. A more detailed memo on the mineralogy is provided in Appendix C. There are two associations for the vanadium. In all three zones, vanadium is associated with the ferric oxide in the ore. In the carbonaceous and transition zones, vanadium is also associated with the carbonaceous matter.

MAGNETIC SEPARATION EXPERIMENTS

Because a substantial amount of iron oxides in the ore, magnetic separation was attempted to concentrate the vanadium into a smaller processing stream, reducing the overall processing costs. In the overall process scheme, the ore is dry-ground and screened (after drying and crushing), and screened fractions are advanced to magnetic separation. Both wet and dry magnetic separations were attempted on all three ore zone types.

For the dry processing trials, the ore was dry-ground to pass 65 mesh and then screened into three fractions: 65 by 150 mesh, 150 by 400 mesh, and minus 400 mesh. Because the minus 400-mesh material was too fine for efficient dry separation, only the coarser fractions were treated. The fractions were treated using a Franz magnetic separator at 1.75 amps (15,000 – 20,000 Gauss). Figure 1 shows the treatment scheme using different angle settings on the separator. The products produced were weighed and assayed for iron and vanadium by energy dispersive XRF analysis. The results, summarized in Table 2, are quite similar for the two feed sizes. Some concentration of the vanadium was demonstrated, with the best result occurring on the oxide material. Although the vanadium was concentrated to greater than 1% in some samples, the recovery was low at (best case) 35%. Tail assays showed a vanadium concentration near 0.2%. As expected, the vanadium recovery was substantially lower in the transition and carbonaceous ores because less of the vanadium was associated with the iron oxide in these zones.

Iron recoveries were near 50% for the oxidized zone but were 27 and 11% for the transition and carbonaceous ores, respectively. Although iron recoveries were greater than the vanadium recoveries, the separation was not sharp, and a large fraction of the iron reported to the tails, which likely contained a fraction of the contained vanadium. The exact correlation between vanadium and iron is complicated by iron in the transition and carbonaceous zones occurring as pyrite, which most likely does not carry vanadium.

For the wet approach, a high-intensity, wet magnetic separator was employed with a field strength approaching 12,000 Gauss. Ore from each zone was dry-ground to pass 200 mesh and then slurried with water to produce a batch of feed. The separator was equipped with a compartment containing steel plates set 1 mm apart. As the slurry passed through the plates, the magnetic material stuck to the plates, and the nonmagnetic material passed through. At the end of a cycle, the compartment was washed with water to remove the remaining nonmagnetic material; the power was then interrupted, and the magnetic material was flushed out.

The magnetic separator was used at three electric current settings—0.5, 1.5, and 2.5 amps; the highest setting corresponded to the maximum field strength of approximately 15,000 Gauss. The results are shown in Table 3. The best recovery (6% of the vanadium in 2% of the oxide ore mass) was obtained at the highest setting, but this value was much lower than the recoveries in the dry separation work. Again, recoveries were lower for the transition and carbonaceous materials than for the oxidized material.

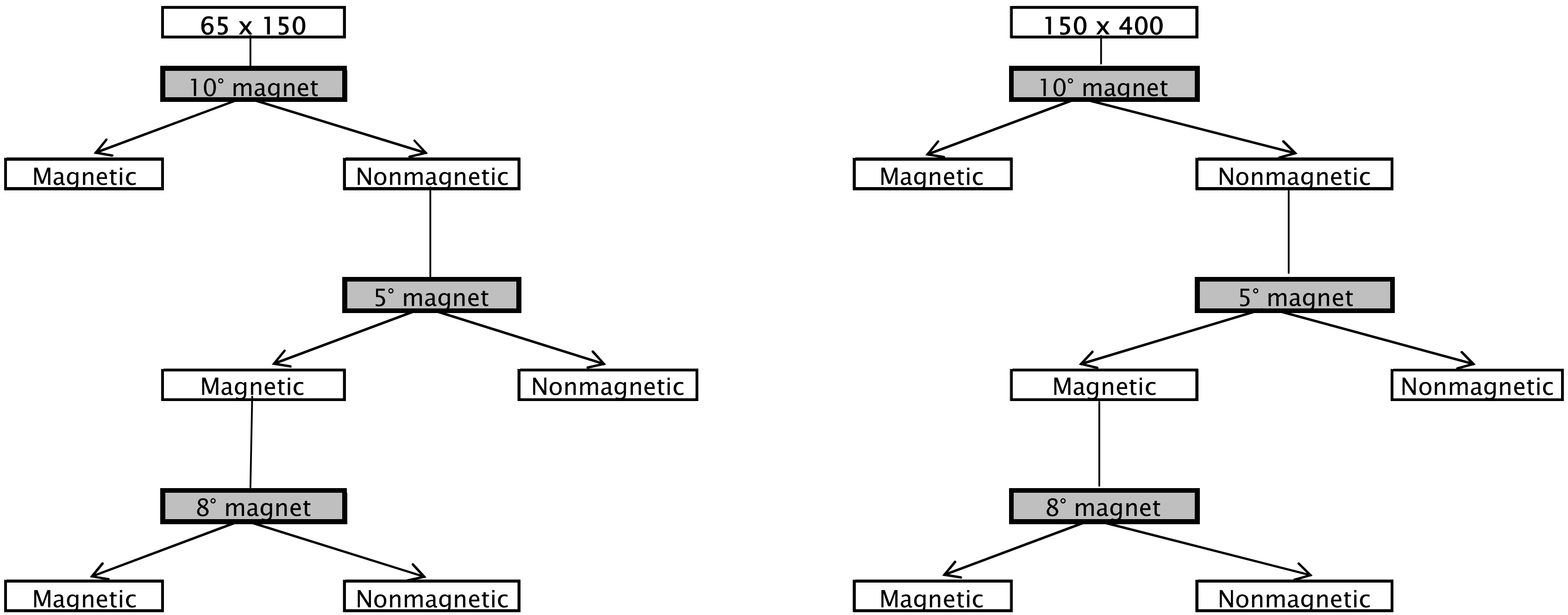

Figure 1. High-Intensity Magnetic Separation Procedure (Frantz 1.75 Amps)

Table 2. Dry Magnetic Separation on Two Fractions
(Page 1 of 2)

Product	65- by 150-Mesh Fraction						150- by 400-Mesh Fraction					
	Wt, g	Wt, %	XRF		Distribution		Wt, g	Wt, %	XRF		Distribution	
			V, %	Fe, %	V, %	Fe, %			V, %	Fe, %	V, %	Fe, %
Oxide Zone												
10° Magnetics	1.3	6.2	1.1	8.4	28.0	45.2	1.6	6.0	1.4	10.5	31.9	49.0
5° Nonmagnetics	16.2	79.3	0.2	0.5	52.8	34.5	19.3	74.7	0.2	0.6	50.2	35.2
8° Magnetics	0.5	2.4	0.5	3.1	5.1	6.5	0.4	1.4	0.6	3.3	3.0	3.6
8° Nonmagnetics	2.5	12.1	0.3	1.3	14.1	13.9	4.6	17.9	0.2	0.9	14.9	12.2
Total	**20.4**	**100.0**	**0.2**	**1.1**	**100.0**	**100.0**	**25.9**	**100.0**	**0.3**	**1.3**	**100.0**	**100.0**
Transition Zone												
10° Magnetics	1.2	3.0	1.0	6.5	12.1	23.3	1.3	2.3	1.3	8.1	11.8	20.2
5° Nonmagnetics	33.9	85.4	0.2	0.5	68.5	54.0	34.0	60.9	0.2	0.6	47.8	40.5
8° Magnetics	0.7	1.8	0.5	2.4	4.1	5.4	0.9	1.7	0.6	3.0	4.4	5.6
8° Nonmagnetics	3.9	9.8	0.4	1.5	15.2	17.3	19.6	35.1	0.3	0.9	35.9	33.7
Total	**39.7**	**100.0**	**0.2**	**0.8**	**100.0**	**100.0**	**55.7**	**100.0**	**0.2**	**0.9**	**100.0**	**100.0**
Carbonaceous Zone												
10° Magnetics	0.9	0.7	1.4	12.7	3.2	9.6	0.3	0.6	1.9	18.0	3.2	8.7
5° Nonmagnetics	114.8	91.8	0.3	0.8	83.0	75.4	41.2	68.8	0.3	1.0	64.9	61.0
8° Magnetics	1.3	1.1	0.7	2.5	2.3	2.7	0.2	0.3	1.0	6.6	0.7	1.5
8° Nonmagnetics	8.1	6.5	0.6	1.9	11.5	12.3	18.2	30.4	0.3	1.1	31.1	28.8
Total	**125.1**	**100.0**	**0.3**	**1.0**	**100.0**	**100.0**	**59.8**	**100.0**	**0.3**	**1.1**	**100.0**	**100.0**

Table 2. Dry Magnetic Separation on Two Fractions
(Page 2 of 2)

Product	65- by 150-Mesh Fraction				150- by 400-Mesh Fraction			
	Wt, g	Wt, %	Distribution		Wt, g	Wt, %	Distribution	
			V, %	Fe, %			V, %	Fe, %
Oxide Zone								
Total Magnetics	1.8	8.6	33.1	51.7	1.9	7.4	34.9	52.6
Total Nonmagnetics	18.7	91.4	66.9	48.3	23.9	92.6	65.1	47.4
Total	20.4	100.0	100.0	100.0	25.9	100.0	100.0	100.0
Transition Zone								
Total Magnetics	1.9	4.9	16.2	28.7	2.2	4.0	16.2	25.8
Total Nonmagnetics	37.7	95.1	83.8	71.3	53.5	96.0	83.8	74.2
Total	39.7	100.0	100.0	100.0	55.7	100.0	100.0	100.0
Carbonaceous Zone								
Total Magnetics	2.2	1.8	5.5	12.3	0.5	0.8	3.9	10.1
Total Nonmagnetics	122.8	98.2	94.5	87.7	59.4	99.2	96.1	89.9
Total	**125.1**	**100.0**	**100.0**	**100.0**	**59.8**	**100.0**	**100.0**	**100.0**

Table 3. Wet Magnetic Separation Results

Product	0.5 amp		1.5 amp		2.5 amp					
							XRF		Distribution	
	Wt, g	Wt, %	Wt, g	Wt, %	Wt, g	Wt, %	V, %	Fe, %	V, %	Fe, %
Oxide Zone, -200 mesh										
Magnetics	1.2	1.3	1.0	1.4	1.0	1.8	0.96	9.81	6.3	12.2
Wash	6.9	7.2	6.3	9.3	5.6	10.8				
Nonmagnetics	86.6	91.5	60.1	89.3	45.3	87.4	0.30	1.47	93.7	87.8
Total	**94.7**	**100.0**	**67.3**	**100.0**	**51.9**	**100.0**			**100.0**	**100.0**
Transition Zone, -200 mesh										
Magnetics	0.8	0.9	1.1	1.8	1.9	2.5	0.35	7.45	3.8	17.2
Wash	7.4	8.7	6.7	10.6	9.5	12.3				
Nonmagnetics	77.2	90.4	55.4	87.6	65.6	85.2	0.26	1.05	96.2	82.8
Total	**85.4**	**100.0**	**63.3**	**100.0**	**77.0**	**100.0**			**100.0**	**100.0**
Carbonaceous Zone, -200 mesh										
Magnetics	2.0	1.8	2.4	3.2	1.9	3.8	0.36	3.37	4.5	11.3
Wash	11.3	10.7	9.2	12.5	7.8	15.8				
Nonmagnetics	92.4	87.5	62.3	84.3	39.8	80.4	0.35	1.24	95.5	88.7
Total	**105.7**	**100.0**	**73.9**	**100.0**	**49.5**	**100.0**			**100.0**	**100.0**

DIRECT LEACHING EXPERIMENTS

Due to the association of vanadium with iron in the ore, it may be possible to leach the vanadium out of the iron oxide mineral, or dissolve the iron oxide, which would allow dissolution of the vanadium. The potential advantage of this vanadium-extraction approach is a relatively simple flowsheet. Three lixiviants were tried on pulverized oxidized ore: dilute H_2SO_4, dilute acid containing SO_2, and Na_2CO_3 solution.

The Na_2CO_3 lixiviant (50 g/L) was used in two leaching experiments. The ferric oxide was not soluble in Na_2CO_3 solution. For this lixiviant to function, the iron oxide material has to be porous to the solution and the vanadium must be in a leachable ionic state. Two experiments were performed on pulverized ore, one using a 6-hr residence time at 50°C and the other using a 48-hr residence time at room temperature. The results of the individual experiments are provided in Appendix D. The final percent extractions were 14% in the 6-hr experiment and 11% in the 48-hr experiment. Some leaching occurred, but because the rate and extent of extraction were limited, this approach was abandoned.

Direct leaching with dilute H_2SO_4 was also tried in a single experiment (Experiment 3031-07). The conditions were a 24-hr residence time, 50 g/L H_2SO_4 (maintained), room temperature, and 33% solids. The experiment is summarized in Appendix E. The vanadium extraction was relatively low at 33%, and acid consumption was near 350 lb/st. Iron assays of the residue showed that a significant fraction of the iron remained; therefore, incomplete attack of the goethite could explain the low vanadium extraction.

One method of attacking iron oxide minerals such as goethite is to use a reductant like SO_2 in combination with acid.[1] This leaching approach was tried in two experiments, 2997-141 and 3031-05. The individual experimental summaries are provided in Appendix F. In Experiment 3031-05, the pulverized oxide ore was leached at room temperature for 6 hr using a nominal 50 g/L H_2SO_4 solution and 33 lb/st SO_2. The vanadium and iron extractions were, respectively, 31 and 24%. This is only a slightly greater vanadium extraction than that obtained in Experiment 3031-07 (with no SO_2) at 8 hr; therefore, a significant improvement was not obtained with SO_2 present. In Experiment 2997-141, the leach time was increased to 24 hr and SO_2 gas was added slowly over the residence time. The total amount of SO_2 added was 285 lb/st. Still, the vanadium extraction was relatively low at 36%.

Because the vanadium and iron extractions in these direct-leaching experiments were relatively low even with fairly high reagent doses, no other direct-leaching experiments were performed.

[1]Warren, I. H., and Hay, M. G. 1975. Leaching of iron oxides with aqueous solutions of sulphur dioxide. *The Institution of Mining and Metallurgy*, C49–C53.

ACID PUGGING, CURING AND LEACHING

As shown in the literature,[2,3] an acid pugging, curing, and leaching process can be used to extract the vanadium. The overall process is shown in Figure 2. In this process, the dry-ground ore is pugged (intimately mixed) with a small amount of water and concentrated H_2SO_4. Dilution of the acid with water and the reaction of acid with the ore raise the temperature of the mixture. The mixture is held at an elevated temperature (110–150°C) for a few hours before the vanadium is leached with water. Some residual unreacted acid, along with the vanadium and sulfate salts, reports to the water solutions. The advantage of this method is an aggressive attack of the vanadium-bearing mineral due to the combination of elevated temperature and strong acid.

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[2]Gupta, C. K., and Krishnamurthy, N. 1992. *Extractive metallurgy of vanadium*, 220–222. Amsterdam: Elsevier.

[3]Ravitz, S. F., Nicholson, I. W., Chindgren, C. J., Bauerle, L. C., Williams, F. P., and Martinson, M. T. 1947. *Treatment of Idaho–Wyoming vanadiferous shales*, Technical Publication No. 2178, Class D, Metals Technology. American Institute of Mining and Metallurgical Engineers.

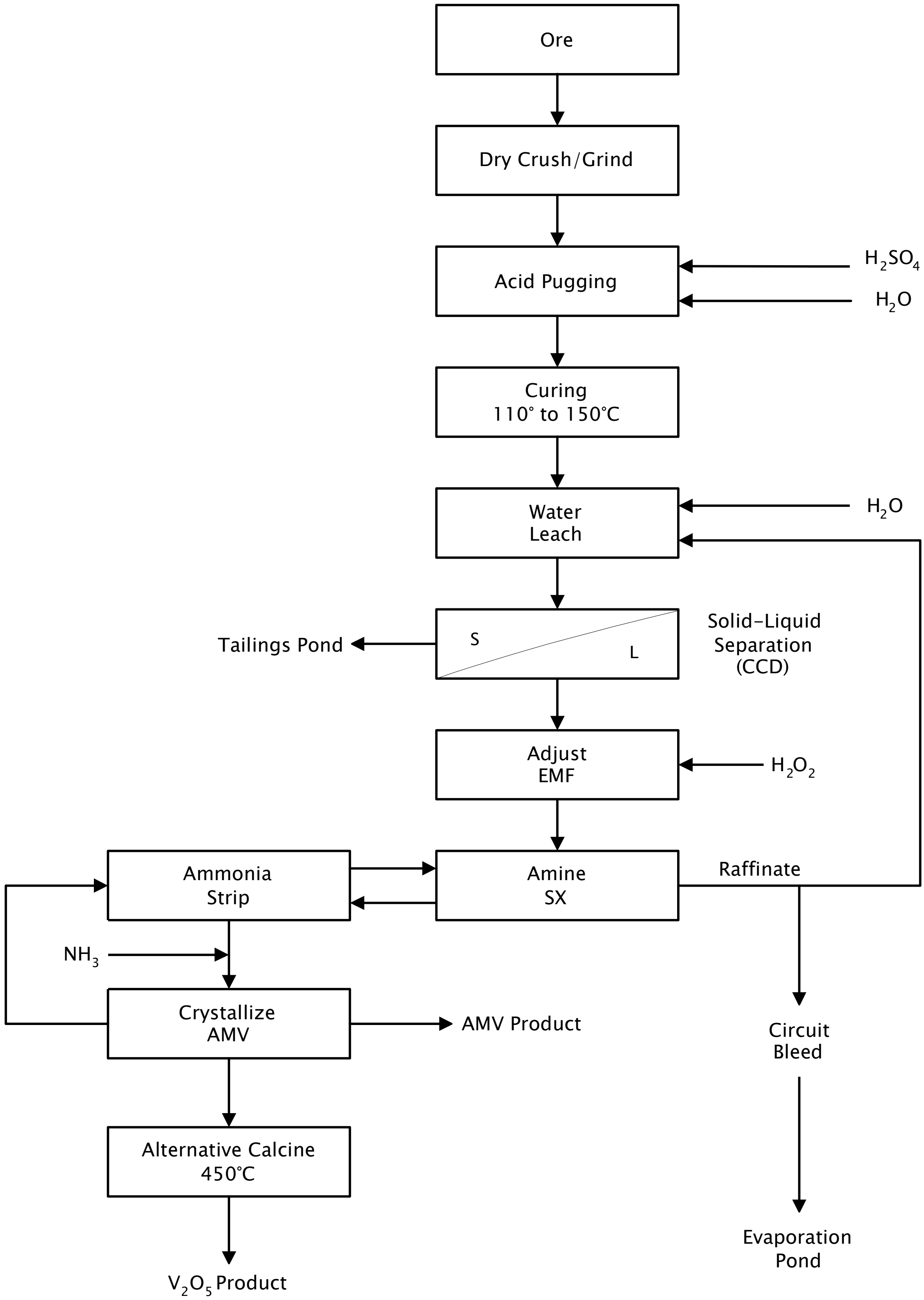


Figure 2. Preliminary Flowsheet for Oxidized Ore Pugging–Curing–Leaching Process

A series of experiments was performed to investigate the variables of water and acid doses, curing time, curing temperature, and leaching time on the oxidized ore. A fine grind was employed for each experiment. The experiments are summarized in Table 4, and individual experimental summaries are provided in Appendix G.

As shown in the table, effective extraction (>90%) of the vanadium from the oxidized ore occurred in three experiments (Experiments 3029-65, 3029-67, and 3029-71). The best extraction (95%) occurred in Experiment 3029-71 with an acid dose of 192 lb/st. A comparison of the results for Experiment 3029-71 with those of 3029-69 and 3029-70 suggests that the larger water dose employed in Experiment 3029-71 improved extractions. The acid consumption in this experiment was significantly less than the amount used in the other two experiments that gave high vanadium extractions. The process conditions and reagent doses are likely not yet optimized. Further experimentation is recommended to see if a high vanadium extraction can be obtained while using less acid and under conditions that reduce costs, i.e., shorter residence times, lower temperatures, and coarser grinds.

Two acid pugging–curing–leaching experiments were also performed on the transition and carbonaceous ore samples; these were Experiments 2997-149 and 2997-148. Vanadium extractions were relatively low at 56 and 50%, respectively. Experimental summaries are reported in Appendix H. A mineralogical examination of the leach residue from Experiment 2997-149 using optical microscopy and the electron microprobe indicated that the vanadium remained in the organic material. A more detailed memo on mineralogy is provided in Appendix C. Little attack or dissolution of the organic matter is expected from the acid. Thus, the pugging–curing–leaching process is not expected to produce a high vanadium extraction from the carbonaceous and transition ores.

Because acid pugging is effective for the oxidized ore, the overall process is described in some detail. Referring to Figure 3, the run-of-mine oxidized ore is dried, crushed, and dry-ground (with classification using screening and, perhaps, air cyclones) to produce dry feed. The ore is then sent to a pug mill in which the appropriate dose of water (or recycled leach liquor) is added, followed by a second mill in which concentrated H_2SO_4 is added. As a result of hydrating the acid and its reaction with the ore, the temperature of the pugged material rises substantially. Some control over the temperature can be exercised by heating the water and/or acid used for pugging. The pugged ore is stored in an insulated and, possibly, heated bin with a residence time appropriate for curing. The pugged material, along with recycled leach solution, is fed from storage to agitated leach tanks. Vanadium dissolution occurs in multiple leach vessels. After leaching, solid–liquid separation occurs using either filtration and washing or countercurrent decantation (CCD) using thickeners. Washed solids are discarded as tailings, while the liquor is polished, filtered, and advanced to solvent extraction (SX). As shown in Figure 2, prior to SX, the vanadium is oxidized to the plus-5 valence state using H_2O_2. In the plus-5 valence state, the vanadium can be extracted from acid solution using amines.

Table 4. Summary of Acid Pugging–Curing and Water Leaching Results for Oxidized Zone Ore

Test Name	Test A	Test B	Test C	Test D	Test E	Test F	Test G	Test #1	Test #2
Book No.	**3029-65**	**3029-66**	**3029-67**	**3029-68**	**3029-69**	**3029-70**	**3029-71**	**3031-02**	**3031-04**
Test Date	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**8/11/2006**	**8/11/2006**
Input									
Sample Type	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone
Sample ID	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254
Grind (Ring & Puck)	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind
Sample, g	100	100	100	100	100	100	100	100	100
DI Water, g	10	10	10	10	10	10	15	10	10
96% H_2SO_4, g	15	10	15	10	10	15	10	15.03	7.51
Pugging Info									
Consistency of pugged material before curing	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, cakes more easily	Blended well, not tacky or sticky	No Data	No Data
Consistency of pugged material after curing	Medium brown, loose	Light Medium brown, loose	Medium brown, loose	Light Medium brown, loose	Light Medium brown, loose	Medium brown, cakes more easily	Medium brown	No Data	No Data
Curing time, hr	8	8	4	4	8	8	8	4	4
Curing Temp, °C	110	110	150	150	150	150	150	110	110
Leach Data									
Leach Time, hr	2	2	2	2	2	2	2	1	1
Leachate	Water	Water	Water	Water	Water	Water	Water	Water	Water
Results									
V extraction based on head and tails, %	93	81	94	82	83	83	95	88	64
V extraction based on calculated head, %	93	82	93	81	82	83	95	88	63
Acid consumption, lb H_2SO_4/st of feed	247	216	264	194	176	288	189	220	122
Acid dose, lb H_2SO_4/st of feed	288	192	288	192	192	288	192	288	144
Final PF pH	1.18	1.55	1.22	1.5	1.52	1.53	1.16	1.07	1.48
Final PF emf	508	539	507	528	518	521	501	541	604
Feed Wt Gain, %	-7	-7	-7	-7	-6	-6	-8	-7	-7

Solvent extraction can be accomplished with either di-2-ethylhexylphosphoric acid (DEHPA) or amine extractants.[2] Figure 2 shows the use of amine. The purpose of SX is to separate the vanadium from the leach liquor. This is accomplished by mixing an organic solution of the extractant (in kerosene, for example) with the aqueous leach solution. During the time in which the organic solution is mixed with the aqueous solution, the vanadium is transferred to the organic phase. The mixture is allowed to settle, and the organic phase is separated (decanted) from the aqueous phase. More than one organic–aqueous contact is normally required to extract a large fraction of the contained vanadium from the leach solution. After SX, the nearly barren aqueous solution (raffinate) is recycled to leaching while the organic phase is advanced to stripping. The organic amine phase is contacted with an NH_3 solution, which (at a much higher pH) strips the vanadium from the amine and brings the vanadium into the aqueous solution as an NH_4VO_3–$(NH_4)_2SO_4$ solution. An ammonium vanadate product (AMV) can be crystallized from the liquor and sold, or can be calcined to produce a V_2O_5 product. A bleed stream from the circuit will be needed to control the buildup of sulfate salts.

SALT ROASTING AND LEACHING

Roasting was tried in an attempt to liberate the vanadium from the carbonaceous component of the transition and carbonaceous ores. The literature[2,4,5,6] shows that an oxidizing roast followed by salt roasting is one method for extracting vanadium from carbonaceous ore. The process flowsheet is shown in Figure 3. The process can be described as follows:

Dry-ground ore is first roasted with excess air at approximately 625–750°C to destroy the carbonaceous material. Salt (NaCl) is then added and mixed at a concentration of approximately 10 wt%, and the material is roasted at 825–850°C. The main chemical reaction is:

$$2NaCl + V_2O_5 + H_2O = 2NaVO_3 + 2HCl \tag{1}$$

As shown in the reaction above, water vapor (humidity) should be present in the air used in the salt-roasting operation. Rotary kilns or multiple-hearth furnaces have been used for the roasting steps. The roaster offgas is scrubbed with water to capture the HCl. Roaster calcine is leached with water and/or acid to dissolve the vanadium. The use of acid is advantageous when the roasting has created calcium vanadate, which is nearly insoluble in water but can be leached readily with acid. The vanadium can be recovered from solution by using SX, as previously described in the acid pugging–curing flowsheet (Figure 2).

---

[4]Goddard, J. B., and Fox, J. S. 1981. Salt roasting of vanadium ores. In *Extractive metallurgy of refractory metals*, ed. H. Y. Sohn, O. N. Carson, and J. T. Smith. The Metallurgical Society of AIME.

[5]Brooks, P. T., Nichols, I. L., and Potter, G. M. Vanadium Recovery from Dolomitic Nevada Shale. TMS Paper Selection A71-51. The Metallurgical Society of AIME.

[6]Burwell, B. 1961. Extractive metallurgy of vanadium. *Journal of Metals* August: 562–566.

Preliminary Flowsheet
Carbonaceous Ore Processing by Salt Roasting and Leaching
HRI 10407

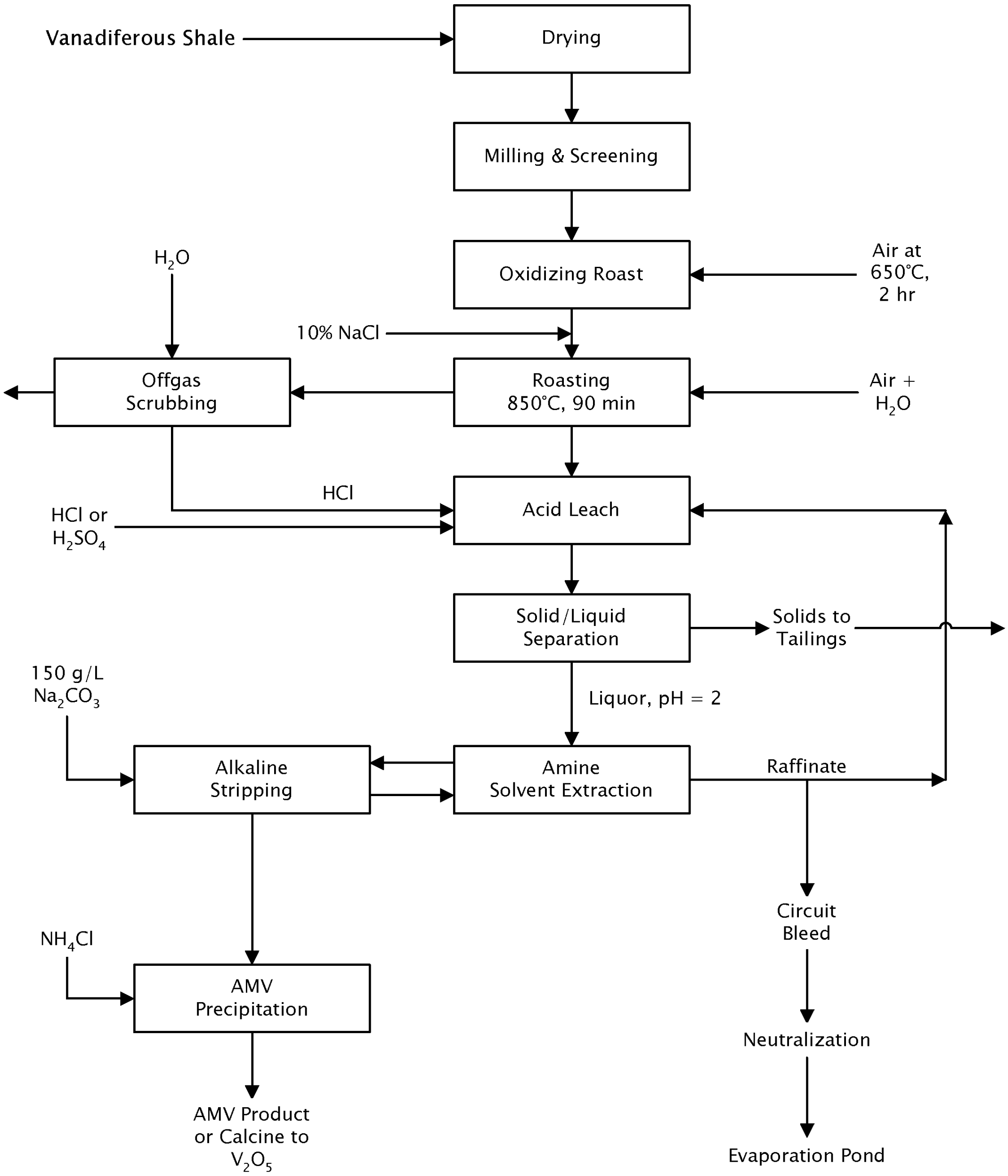


Figure 3. Preliminary Flowsheet for Carbonaceous Ore Processing by Salt Roasting and Leaching

Roasting was examined in four experiments, each consisting of a two-stage roast followed by leaching with water and then acid. Quartz rotary kilns were used in our laboratory experiments. Three experiments were conducted on the carbonaceous ore and one on the transition material. The oxidized ore was not used, but the literature[5] suggests that the recoveries will be higher for oxidized ore than for carbonaceous ore and that a preliminary oxidizing roast will not be required.

The experimental conditions and results for the four experiments are shown in Table 5. Summaries of the individual experiments are provided in Appendix I. For the carbonaceous ore, the conditions altered between experiments were the salt-roasting temperature and the salt grinding. Humidified air was used in every experiment. The best result of a 74% vanadium extraction was obtained at a roast temperature of 850°C and with ground salt. This result is within the extraction range normally expected for salt roasting[2] and is better than that shown for carbonaceous shale in Brooks et al.[5] There was a slight improvement in extraction (71–74%) between Experiments 1 and 2, which might be due to pulverizing the salt, or simply due to ordinary variability between experiments. Grinding the salt might result in a more even distribution of the molten NaCl. The only significant differences between Experiments 2 and 3 were the roasting temperatures and the salt amount. Apparently, 850°C with 12% NaCl is better than 825°C and a lower amount of salt.

Results for the transition ore were slightly lower at 70% vanadium extraction. A higher salt-roasting temperature may improve this.

As shown in the table, more vanadium was extracted in the water leaching than in the acid leaching, but only because the water leach was performed first. A significant increase in overall extraction was achieved by using acid. It may not be practical to perform two leaching steps; therefore, a simpler flowsheet, as the one shown in Figure 3, employs only acid leaching. The vanadium extraction would likely be similar to the two-stage approach. Some HCl would be available from scrubbing the salt-roaster offgas. If additional salt-roasting experiments are conducted in the future, a single-stage acid leach should be tried.

As with the acid pugging, curing, and leaching process, the results shown are probably not optimized. It is unlikely the best conditions have been achieved with just the few experiments performed considering the number of variables involved. Additional experimental work is recommended to optimize the conditions in the roasting–leaching process.

Another variation of the roasting–leaching process would be to conduct an oxidizing roast for the destruction of the organic matter, then use the acid pugging–curing approach for the roaster calcine. This approach has not been tried but should be investigated if additional work is performed in the future.

Table 5. Roast–Leach Carbonaceous and Transition Ore Summary

Test	1	2	3	4
Part 1—Oxidizing Roast				
Experiment description	Oxidizing Roast Step	Oxidizing Roast Step	Oxidizing Roast Step	Oxidizing Roast Step
Feed material	Pulverized Carbonaceous	Pulverized Carbonaceous	Pulverized Carbonaceous	Pulverized Transition
temp, °C	625	625	625	625
Roast time, min	120	140	140	120
Airflow, slpm	6	4	4	2 – 4
Feed amount, g	250	400	400	150
Calcine amount, g	202	334.8	334.8	108.5
Weight loss or gain, %	-19.2	-16.3	-16.3	-27.7
Part 2—Salt Roast				
Experiment description	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. Grade not pulverized).	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. pulverized).	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. pulverized).	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. pulverized).
Feed material	Oxidizing roast step calcine.	Oxidizing roast step calcine comp.(85 g test #1 +15 g test 2 calcine)	Oxidizing roast step calcine from Test 2.	Oxidizing roast step calcine.
Amount advanced to NaCl roast ,g	100	100	100	106.44
Amount of NaCl used, g:	12	12	10	10.6
Roast temp, °C	825	850	825	825
Roast time, min	90	90	90	90
Air Flow, slpm	2	2	2	2
Calcine amount, g	124.2	107.4	106.9	113.7
Weight loss or gain, %	24.2	7.40	6.90	6.82
Part 3—Water and Acid Leach				
Water leaching feed	621 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching	537 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching.	535 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching.	569 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching.
Leaching temp, °C	60	60	60	60
Water leaching time, hr	1	1	1	1
Water leach V in PF, g/L	0.29	0.406	0.285	0.398
Water leach V extraction, %	58	58	47	49
Acid leaching feed	Water leach residue (wet)	Water leach residue (wet)	Water leach residue (wet)	Water leach residue (wet)
Acid Leaching Feed, g	122.2	131.6	139.5	192.7
Leaching Temp, °C	60	60	60	60
Acid Leaching Time, hr	2	2	2	2
Acid Leach V in PF, g/L	0.103	0.13	0.125	0.159
Acid Leach V extraction, %	16	16	16	21
Overall V extraction, %	74	74	63	70
Products/Feed Vanadium Balance, %	91	98	97	86

We hope the results of this study are valuable to you. Should you have any questions about this report, please do not hesitate to call me.

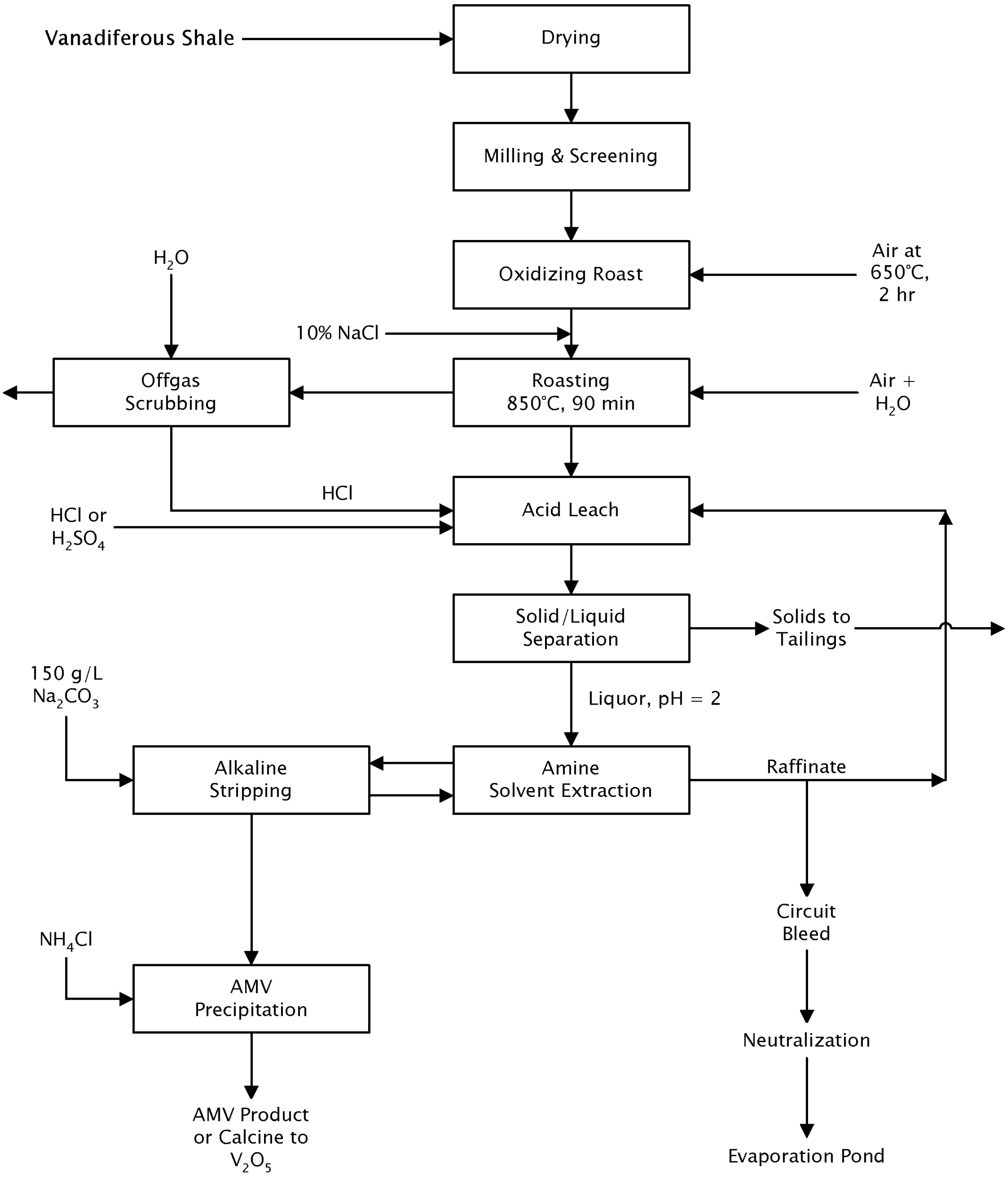
Sincerely,

Dave Baughman
Senior Project Engineer

DB/bkm

xc: Nick Hazen, Hazen Research, Inc.

Preliminary Flowsheet
Carbonaceous Ore Processing by Salt Roasting and Leaching
HRI 10407



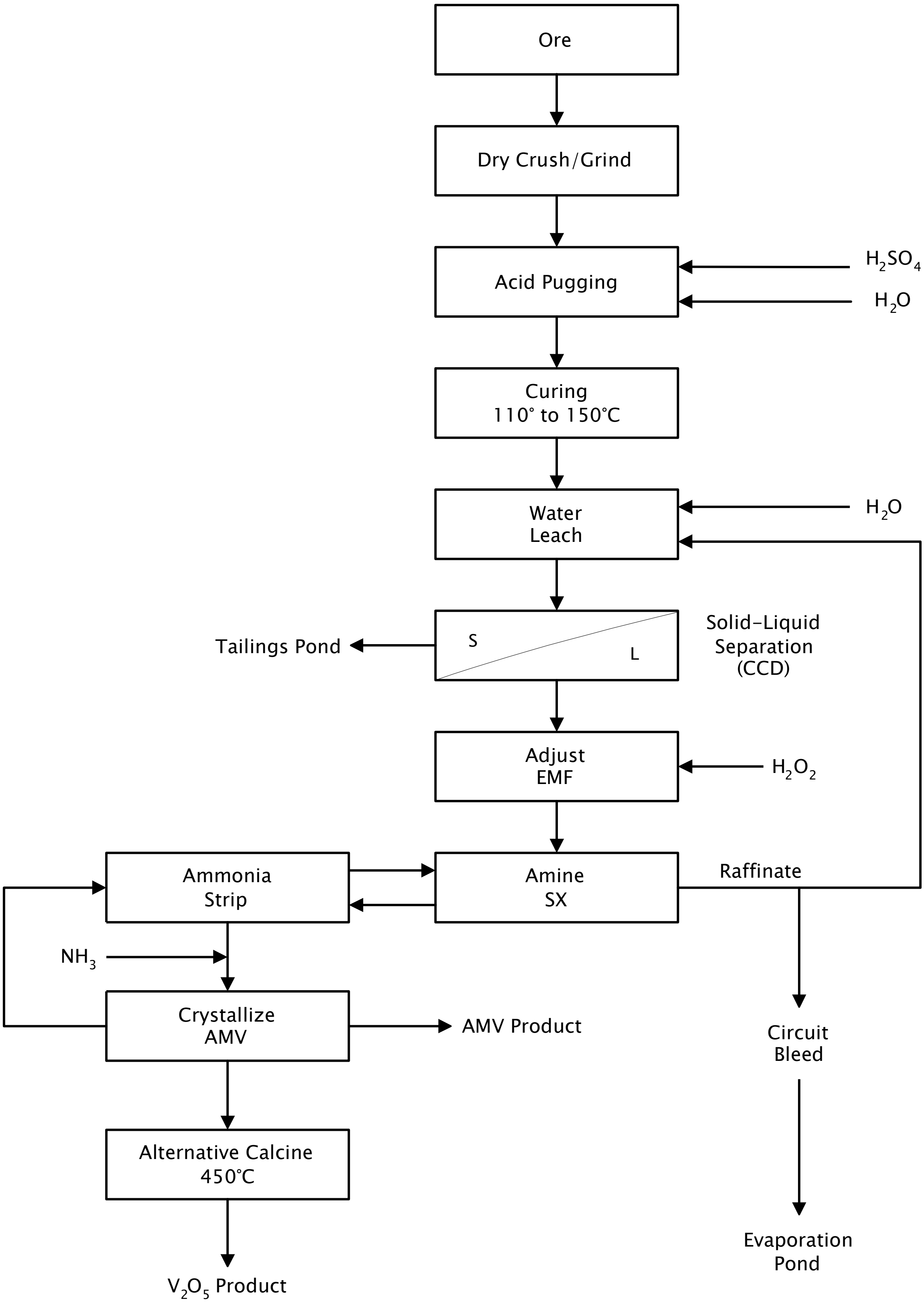


Figure 2. Preliminary Flowsheet for Oxidized Ore Pugging–Curing–Leaching Process

Table 4. Summary of Acid Pugging–Curing and Water Leaching Results for Oxidized Zone Ore

Test Name	Test A	Test B	Test C	Test D	Test E	Test F	Test G	Test #1	Test #2
Book No.	**3029-65**	**3029-66**	**3029-67**	**3029-68**	**3029-69**	**3029-70**	**3029-71**	**3031-02**	**3031-04**
Test Date	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**11/27/2006**	**8/11/2006**	**8/11/2006**
Input									
Sample Type	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone	Oxidized Zone
Sample ID	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254	HRI 51254
Grind (Ring & Puck)	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind	Fine Grind
Sample, g	100	100	100	100	100	100	100	100	100
DI Water, g	10	10	10	10	10	10	15	10	10
96% H_2SO_4, g	15	10	15	10	10	15	10	15.03	7.51
Pugging Info									
Consistency of pugged material before curing	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, not tacky or sticky	Blended well, cakes more easily	Blended well, not tacky or sticky	No Data	No Data
Consistency of pugged material after curing	Medium brown, loose	Light Medium brown, loose	Medium brown, loose	Light Medium brown, loose	Light Medium brown, loose	Medium brown, cakes more easily	Medium brown	No Data	No Data
Curing time, hr	8	8	4	4	8	8	8	4	4
Curing Temp, °C	110	110	150	150	150	150	150	110	110
Leach Data									
Leach Time, hr	2	2	2	2	2	2	2	1	1
Leachate	Water	Water	Water	Water	Water	Water	Water	Water	Water
Results									
V extraction based on head and tails, %	93	81	94	82	83	83	95	88	64
V extraction based on calculated head, %	93	82	93	81	82	83	95	88	63
Acid consumption, lb H_2SO_4/st of feed	247	216	264	194	176	288	189	220	122
Acid dose, lb H_2SO_4/st of feed	288	192	288	192	192	288	192	288	144
Final PF pH	1.18	1.55	1.22	1.5	1.52	1.53	1.16	1.07	1.48
Final PF emf	508	539	507	528	518	521	501	541	604
Feed Wt Gain, %	-7	-7	-7	-7	-6	-6	-8	-7	-7

Table 5. Roast Leach Carbonaceous and Transition Ore Summary

Test	1	2	3	4
Part 1—Oxidizing Roast				
Experiment description	Oxidizing Roast Step	Oxidizing Roast Step	Oxidizing Roast Step	Oxidizing Roast Step
Feed material	Pulverized Carbonaceous	Pulverized Carbonaceous	Pulverized Carbonaceous	Pulverized Transition
mp, °C	625	625	625	625
Roast time, min	120	140	140	120
Airflow, slpm	6	4	4	2 – 4
Feed amount, g	250	400	400	150
Calcine amount, g	202	334.8	334.8	108.5
Weight loss or gain, %	-19.2	-16.3	-16.3	-27.7
Part 2—Salt Roast				
Experiment description	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. Grade not pulverized).	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. pulverized).	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. pulverized).	Roasting with NaCl to produce sodium vanadate (used 10% NaCl A.R. pulverized).
Feed material	Oxidizing roast step calcine.	Oxidizing roast step calcine comp.(85 g test #1 +15 g test 2 calcine)	Oxidizing roast step calcine from Test 2.	Oxidizing roast step calcine.
Amount advanced to NaCl roast ,g	100	100	100	106.44
Amount of NaCl used, g:	12	12	10	10.6
Roast temp, °C	825	850	825	825
Roast time, min	90	90	90	90
Air Flow, slpm	2	2	2	2
Calcine amount, g	124.2	107.4	106.9	113.7
Weight loss or gain, %	24.2	7.40	6.90	6.82
Part 3—Water and Acid Leach				
Water leaching feed	621 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching	537 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching.	535 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching.	569 g DI H_2O used to rinse kiln solids from kiln. Advanced to leaching.
Leaching temp, °C	60	60	60	60
Water leaching time, hr	1	1	1	1
Water leach V in PF, g/L	0.29	0.406	0.285	0.398
Water leach V extraction, %	58	58	47	49
Acid leaching feed	Water leach residue (wet)	Water leach residue (wet)	Water leach residue (wet)	Water leach residue (wet)
Acid Leaching Feed, g	122.2	131.6	139.5	192.7
Leaching Temp, °C	60	60	60	60
Acid Leaching Time, hr	2	2	2	2
Acid Leach V in PF, g/L	0.103	0.13	0.125	0.159
Acid Leach V extraction,	16	16	16	21
Overall V extraction, %	74	74	63	70

Products/Feed Vanadium Balance, %	91	98	97	86

APPENDIX 3

General process and parameters used to update Stina resource model, by Maptek.

1. Drillhole database updated

   Collar, assay and survey CSV files were exported from the previous drill hole database and the collar table was updated with the correct drill hole locations. RC hole RBMK-04-02 was added to the database and assay values were calculated and hand entered into the Assay table based upon the ALS Chemex assay results provided to Maptek by Stina's geologist, Ed Ullmer. An additional lithologic zone, the lower limit cutoff of V_2O_5 ore (lower limit (ll) reduced ore), representing a grade change in the reduced zone based upon a 0.2 cutoff, was added to the lithology column of the Assay table. The boundary between the reduced and ll-reduced zones were provided and approved by Stina's geologist. Note: Due to errors in the previous project survey (found in the AutoCAD.dwg), all files for this project needed to be recreated as the project spaces did not align. The differences between the earlier 2008 Maptek results and this interpretation is due to minor hole location corrections of several of the drill holes and the addition of hole RC 04-2 to the grid in Area A-North.
2. Oxide, Reduced and ll-Reduced boundaries defined

   Drill holes loaded into Vulcan's Envisage and boundaries were defined down the drill holes by points and extrapolated between drill holes on the sections.
3. Structure roof and floor grids created for lithology boundaries

   Surface floor grids for the oxide and reduced zones were created from the boundary points using 10 ft interval grid spacing. All grids were generated using an inverse distance squared method except the structure roof of ll-reduced. As the ll-reduced structure roof represented a complex geologic boundary, the triangulation method better modelled the high angled elevation changes seen spaciously between the drill holes. Only one drill hole contact (RBMK-07-03) between the reduced and ll-reduced zones was not honored due to the complex geometric relationships with the surrounding holes (high-angle, reverse relationship).
4. Surface Triangulations created from grids

   Grids were unmasked to extrapolate the contacts throughout the model area and then triangulated
5. Straight compositing run on drillhole database

   Straight compositing was run on the drillhole database to get from-to intervals assay intervals. Intervals were broken by lithology contact found in the database and not by the triangulated structure roofs/floors. This allowed all samples to maintain the proper lithology tags (meaning that all reduced samples in RMBK-07-02 remained flagged as "reduced").
6. Block model created

   One rotated (parallel to the ore trend), extended block model was created. A parent block size of 50x50x50 feet and a sub-block size of 10x10x10 feet were used for the model. (A smaller parent block size was used in this model for aesthetic purposes and only impacted the resulting air blocks as block limits for the oxide, reduced and ll-reduced zones were used to keep blocks from getting larger than 10x10x10). The surface roof triangulation of the oxide zone and the structure floor triangulations for the reduced and lf reduced zones were used to flag the lithology zones within the model.

7. Grade estimation run on block models

   Grade estimation is used to estimate grades for each block within the Vulcan block model. Due to the nature of the drillhole data within the deposit, the method of grade estimation used for the assessment was inverse distance squared. A search ellipse of 400 feet in the x-direction, 400 feet in the y-direction and 200 feet in the z-direction at a trend of 21°NE and plunge of 20, was used to find grade samples (composited drill holes) for each block estimate. Each estimate had a minimum requirement of two samples and a maximum of 40 samples; and a limit of three samples per single drillhole was also used to ensure the estimate was not biased by only a few drill holes. When the estimate is run, the ellipse is centered within each block and any assay samples that fall within the ellipse, according to the sample limits, are weighted using the inverse distance squared equation and used to estimate the grade for each block. The average distance to samples, measured along the anisotropic axis, was stored in the block model for each block estimate, to be used later to define blocks that were "measured", "indicated" or "inferred" samples and blocks to be estimated were restricted by lithology to ensure that only oxide samples were used to estimate oxide blocks, reduced samples to estimate reduced blocks, etc. By restricting samples and block to lithology, we are assuming a hard contact between the oxide, reduced and ll-reduced zones, i.e. the grade found in one zone is not influenced by the grade in another zone.

8. Solid triangulation created around southern area

   An enclosed triangulated volume was created around the southern portion of the block model and included holes: RBMK-05-01, RBMK-05-02 and RBMK-05-03.

9. Resource class calculated

   A block calculation script was created to calculate resource class based upon the average anisotropic distances between the block and drillhole samples (created and stored during the grade estimation process, were used to define the class variable). Distances between 0-200 feet were determined as "indicated" and distances greater than 200 feet were flagged as "inferred". "Measured" was used as a category in the data compilation but not in the displayed results in order to avoid confusion. The solid triangulation of the southern area was used to reflag the class variable as "inferred" after the class calculation script was run.

10. Advanced Reserves run on estimated block models

    Cutoff values of 0.1, 0.2 and 0.3 percent V_2O_5 along with lithology (oxide and reduced only as ll-reduced is considered waste by Stina's geologist), and MII was used to breakdown the resource estimate. The cutoff values were not used as intervals, i.e. 0.1 to 0.2, 0.2 to 0.3 (etc), but rather were used to determine the tonnage of the resource at and above 0.3, at and above 0.2 percent (etc). An overall density value of 0.074 short tons per cubic foot or 2.3 grams per cubic centimeter (≈ 13.5 tonnage factor) was used to estimate the tonnages of the resource.

Note: Statistics were completed after construction of the drillhole database, composite database, block model construction and estimation to check consistency of data.

CERTIFICATE OF QUALIFIED PERSON
DATE AND SIGNATURE PAGE

NI 43-101 Technical Report for:
Bisoni McKay Vanadium Property, Nye County, Nevada
October 23, 2015 (amended August 29, 2016)

Certificate of Author – Edwin Ullmer

"This certificate applies to the technical report entitled "BISONI McKAY VANADIUM PROPERTY", dated October 23, 2015 (amended August 29, 2016).

1. I, Edwin Ullmer, do hereby certify that I am a geologic consultant for Stina Resources Ltd., Suite 10, 8331 River Road, Richmond, B.C., Canada,V6X 1Y1. My residence is 11815 Bradburn Blvd, Westminster, Colorado, U.S.A. 80031. My business address is the same. Email address – edullmer@aol.com. Phone (303) 466-8547

2. I am an independent geologic consultant and contractor for the mining industry.

3. I graduated with a degree of Bachelor of Arts in Geology from Upsala College, East Orange, New Jersey, U.S.A. in 1963. In addition, I obtained a Master of Science Degree in Geology from the University of Arizona, Tucson, Arizona, U.S.A. in 1975 and a Master of Education Degree from University of Arizona in 1973.

4. I am a registered professional geologist in the State of Wyoming - No. PG-894, and the State of Nebraska - No. G-0 177, and a certified professional member of the AIPG (American Institute of Professional Geologists) – CPG No. 11442.

5. I have worked as a minerals, mining, and environmental geologist for 40 years. My experience includes, but is not limited to field duties and management of grass roots exploration and property development, mine geology, both as a field geologist and project management.

6. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-10 1) and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.

7. I am responsible for the authorship of the Phase II Technical Report that includes Items 4 to 12, 14, 15, 16, 23, 24, 27 and portions of 1, 2, 3, 25 and 26 of the Bisoni McKay Vanadium Property, Nye County, Nevada Report for Stina Resources Ltd, October 23, 2015 (amended August 15, 2016),

8. As the QP for this Technical Report I am responsible for Item 14, the mineral resource estimates, disclosed in this report. My work history includes being responsible for assessing and quantifying mineral resources and reserves for a number of commodities at several mine settings.

9. My previous involvement with the property includes field exploration from 2006, and authoring the 2008 Technical Report (amended in 2012), including review of related news releases. Prior to that I had no previous involvement with the property.

10. My last inspection of the BMK property was carried out from October 5 to 9, 2015.

11. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

12. I have read NI 43-101 and Form 43-101, and the Phase II Technical Report has been prepared in compliance with that instrument and form.

13. I consent to the filing of the Bisoni McKay Vanadium Property, Nye County, Nevada Phase II Technical Report dated October 23, 2015 (amended August 29, 2016) with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Phase I Technical Report.

14. At the effective date of the report, October 23, 2015 (amended August 29, 2016), to the best of my knowledge, information, and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 29, August 2016

Edwin Ullmer
Signature of Qualified Person

EDWIN H. BENTZEN III

I, Edwin H. Bentzen III, of Wheat Ridge, Colorado, do hereby certify:

I am an Associate of Resource Development Inc. with a business address at 11475, I-70, Frontage Road North, Wheat Ridge, Colorado, 80033.

This certificate applies to the technical report entitled "BISONI McKAY VANADIUM PROPERTY", dated October 23, 2015 **(amended August 29, 2016)** (the "Technical Report").

I am a graduate of the Mackey School of Mines, University of Nevada, Reno, Nevada, (BSc. Metallurgical Engineering, 1967). I am a Registered Member in good standing of the Society of Mining, Metallurgy and Exploration, Inc. License #229580RM and the American Chemical Society. I have been practicing my profession as an engineer for over 49 years in the discipline of extractive mineral beneficiation. I have been employed in consulting engineering research and process development since graduation from the University of Nevada in 1967. I have worked on over 100 projects, including three recent rare earth mineral projects and have authored or co-authored over 25 professional papers/presentations at National and International meetings.

I have read the definition of "qualified person" specified in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101), and past relevant work experience, I fulfill the requirements for a "Qualified Person" for the purposes of National Instrument 43-101 (the "Instrument").

I never visited the Property reference in this report.

I am responsible for Items 13, 17, 21, 22, and portions of Items 1, 2, 3, 25 and 26, the portions relating to mineral processing

I am independent of Stina Resources Ltd. as defined by Section 1.5 of the Companion Policy 43-101CP of National Instrument 43-101 and am independent of the property and the property vendor as required under Section 3.2 of Appendix 3F *Mining Standards* of the TSX Venture Exchange Corporate Finance Manual.

I have no prior involvement with the Property that is the subject of the Technical Report.

I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report that I am responsible for has been prepared in compliance with the Instrument.

I consent to the filing of the Bisoni McKay Vanadium Property, Nye County, Nevada Phase II Technical Report dated October 23, 2015 (amended August 29, 2016) with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Phase I Technical Report.

As of the date of this certificate, to the best of my knowledge, information and belief, the sections of the Technical Report that I am responsible for contains scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 29 day of August, 2016 at Wheat Ridge, Colorado.

Edwin H. Bentzen III
Signature of Qualified Person

SME
Society for
Mining, Metallurgy
& Exploration
Edwin H Bentzen III
SME Registered Member No. [illegible]
Signature__________
Date Signed__________
Expiration date [illegible]