

A report prepared for X-Cal Resources Ltd.

**EXPLORATION POTENTIAL OF THE SLEEPER PROJECT,  
NEVADA: AN UPDATE**

Richard H. Sillitoe

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## CONTENTS

EXECUTIVE SUMMARY	3
INTRODUCTION	4
MINERALIZATION STYLES	4
Northern Nevada epithermal province	4
Sleeper district	5
EXPLORATION POTENTIAL	5
Preamble	5
Facilities gold resource	6
Additional low-grade gold potential	8
EXPLORATION RECOMMENDATIONS	9
Facilities expansion	9
District-scale activities	9
<b>FIGURES</b>	
Figure 1 Priority exploration targets, Sleeper district	7
Figure 2 Facilities area, section 4576200N – Gold model	7

## EXECUTIVE SUMMARY

- A follow-up visit to the Sleeper gold project in Nevada on behalf of the owner, X-Cal Resources, was designed to update the exploration potential of the district, which was first appraised by the writer at the beginning of 2006.
- During the previous appraisal, five priority exploration targets were selected for consideration. During the ensuing 3½ years, X-Cal Resources gained control of 100% title to the property and partially investigated two of the target areas. At the Range Front target, a NI 43-101-compliant, indicated-plus-inferred resource has been defined in the Facilities sector, which, along with the aboveground resources in the old leach pads and tailings impoundment, are currently the subject of a preliminary economic assessment.
- The Facilities resource is judged to be open in several places, most notably to the north beneath and immediately alongside one of the old leach pads. Step-out drilling is recommended in an attempt to expand the existing resource. Infill drilling may also be required, and could perhaps be designed in such a way as to determine the continuity of several bonanza-grade gold vein intersections.
- Low-grade, sulfidic gold mineralization is partly defined beneath the Facilities and West Wood areas and is known to exist elsewhere in the district, much of it enveloping the bonanza-grade gold veins for which the Sleeper district is best known.
- A large tonnage of apparently similar, low-grade gold-silver mineralization was recently announced by Allied Nevada at Hycroft, a low-sulfidation epithermal deposit possessing perceived geologic and mineralogic similarities to Sleeper. Preliminary metallurgical test work suggests that the sulfide component of the resource may well be amenable to conventional flotation and production of a gold-bearing concentrate suitable for further treatment.
- As a result of recent marked increases in the gold price, the low-grade gold mineralization in the Sleeper district must now be considered to be of potential interest, and needs to be subjected to preliminary flotation testing. Should favorable results be forthcoming, a major district-scale exploration effort would be fully justified.
- Estimation of the global pre-mine gold and silver endowment of the Sleeper deposit and immediately surrounding areas, using all available drilling data, would provide an order-of-magnitude figure, which would contribute to assessment of the bulk-mining potential of the district.
- It is recommended that the initial exploration effort be focused on the five original target areas, which are considered prospective not only for their originally proposed bonanza-grade potential, but also for much larger-tonnages of low-grade gold mineralization.

## INTRODUCTION

At the request of Shawn Kennedy, the writer spent 2½ days reviewing exploration potential of the Sleeper project in Humboldt County, Nevada, on behalf of X-Cal Resources Ltd. The review was a follow-up to the one carried out in January 2006.

The review benefited from the participation of a group of individuals having a long association with the Sleeper project, namely Keith Blair (consulting geologist), Shawn Kennedy (President, X-Cal Resources), Larry Kornze (consulting geological engineer), Larry Martin (senior geologist, X-Cal Resources), Win Rowe (consulting geologist), Ken Snyder (consulting geologist), and Jim Wright (consulting geophysicist).

This short report, prepared on site, summarizes the gold mineralization styles present in the previously mined Sleeper deposit and its environs preparatory to reassessment of the potential of the Sleeper project. Generalized exploration recommendations are also provided.

## MINERALIZATION STYLES

### **Northern Nevada epithermal province**

A period of east-west-directed extensional tectonism and compositionally bimodal (basalt-rhyolite) volcanism affected northern Nevada from the mid-Miocene (~16 Ma) through to the present day. Widespread epithermal gold ± silver mineralization, almost entirely of low-sulfidation type, accompanied this tectono-magmatic event, and is being mined and/or explored at a number of localities. The currently known gold endowment of the northern Nevada epithermal province approximates 30 million oz.

Most of the precious-metal deposits and prospects lie along three prominent, broadly north-trending magnetic lineaments, the best documented of which is the Northern Nevada rift. The other two fundamental structures, frequently termed the King's River and Western Nevada rifts, lie farther west. The Sleeper deposit is located on the King's River rift, close to its junction with an obliquely south-southwest-divergent magnetic feature.

The northern Nevada province is best known for low-sulfidation epithermal gold mineralization of bonanza-grade vein type, with the Sleeper, Midas, Ivanhoe, and Mule Canyon deposits immediately coming to mind. However, there is in fact a diversity of low-sulfidation epithermal styles present in the region, with bulk-tonnage, low-grade mineralization being particularly prominent at some localities. The low-grade gold mineralization occurs at a higher paleo-elevation than the bonanza-grade veins at Ivanhoe-Hollister; is present in the same general vicinity as, and broadly envelops, the high-grade veins at Sleeper and Hycroft; and may exist largely alone at Florida Canyon and Goldbanks.

Another attribute of the northern Nevada low-sulfidation epithermal deposits is their shallow exposure levels, with near-paleosurface features preserved at many places. These include sinter aprons, generated by hydrothermal fluids debouching subaerially within topographic depressions, at Buckskin National, Hycroft, Goldbanks, Ivanhoe-Hollister, and elsewhere; and zones of acid leaching developed in the steam-heated environment between paleo-water tables and paleosurfaces (the vadose zone) at Buckhorn, Buckskin National, Ivanhoe-Hollister, and particularly extensively at Hycroft. As noted previously, the erosion level in

the Sleeper district has removed any subaerial sinter and only patchily preserved the basal portions of the steam-heated environment.

### **Sleeper district**

Three broadly contemporaneous and apparently transitional mineralization styles exist in and around the Sleeper deposit: bonanza-grade veins, high-grade hydrothermal breccias, and low-grade hydrothermal breccias and stockworks. Field and core observation confirms that the veins commonly post-date but also, locally, pre-date the hydrothermal brecciation.

The best documented of these styles are the bonanza-grade veins, which are characterized by crustiform-banded, quartz-chalcedony-adularia veins containing only a few volume percent sulfides, along with prominent naumannite (silver selenide) and native gold. The Sleeper, Wood, West, and Office veins, all exploited by Amax, were of this type, although additional, apparently smaller examples are also known elsewhere in the district (e.g. Facilities area; see below).

The high-grade hydrothermal breccia style occurs throughout the district, but is undoubtedly best represented by the West Wood structure, which dips steeply eastward in contrast to the westerly dips of most of the bonanza-grade veins. These high-grade breccias are siliceous and, where unoxidized, have typically monomictic clast populations cemented by dark-colored (sulfide-impregnated) chalcedony, pyrite, and marcasite. Some, but probably not all of the gold is free and locally visible.

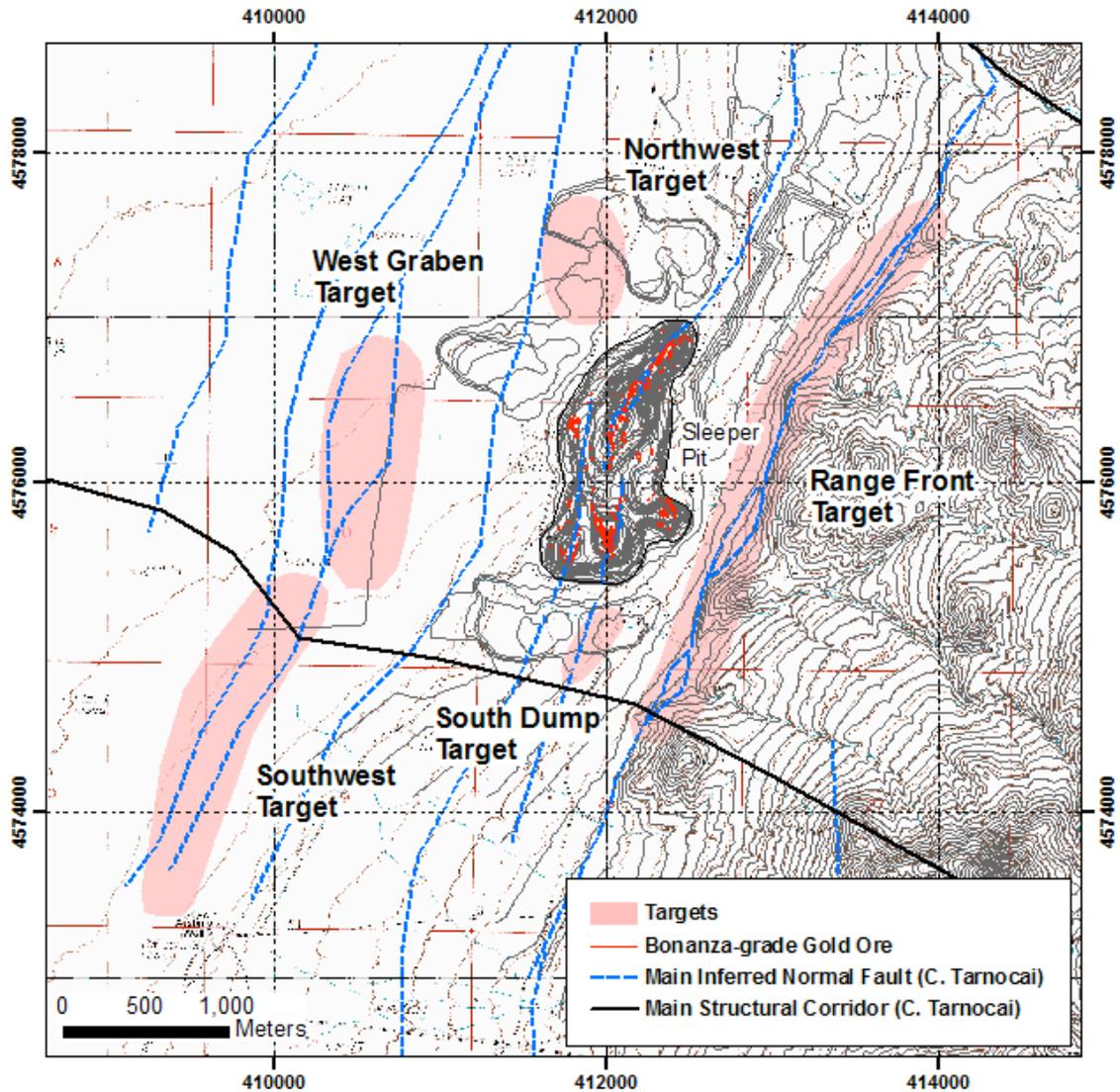
These high-grade hydrothermal breccias appear to be transitional to similar breccias and extensive zones of associated stockwork veinlets containing only low-grade gold values. This mineralization style is volumetrically far more important than the preceding two styles, and tends to envelop them at the district scale. This low-grade gold mineralization, like its higher-grade counterpart, is highly siliceous and sulfidic where unoxidized. The brecciated and veined rocks are transformed to massive chalcedony, within which the breccia cement and veinlet arrays comprise chalcedony, pyrite, and marcasite. The low-tenor gold content is not visible, and its mineralogic residence remains to be determined.

## **EXPLORATION POTENTIAL**

### **Preamble**

The writer's previous (January 2006) visit to the Sleeper project resulted in recommendation of five priority target areas for further detailed exploration, namely Range Front east of the Sleeper pit, Northwest, West Graben, and Southwest west of the pit, and South Dump south of the pit (Fig. 1). The geologic, geochemical, and geophysical justification for target selection is summarized in the 2006 report. The prime target at all five localities was bonanza-grade, low-sulfidation epithermal veins of Sleeper type, but potentially better developed both laterally and vertically.

Following acquisition of 100 % of the property title, part of the Range Front target area, in the Facilities sector, was extensively investigated while work was initiated in the Northwest target area. A resource was defined at Facilities, albeit mainly comprising the low-grade breccia-stockwork mineralization style rather than bonanza-grade veins. In addition, further exploration was conducted at the previously defined West Wood breccia structure and its



**Figure 1. Priority Exploration Targets, Sleeper District**

general vicinity, immediately southwest of the Sleeper pit, because of the high reported grades.

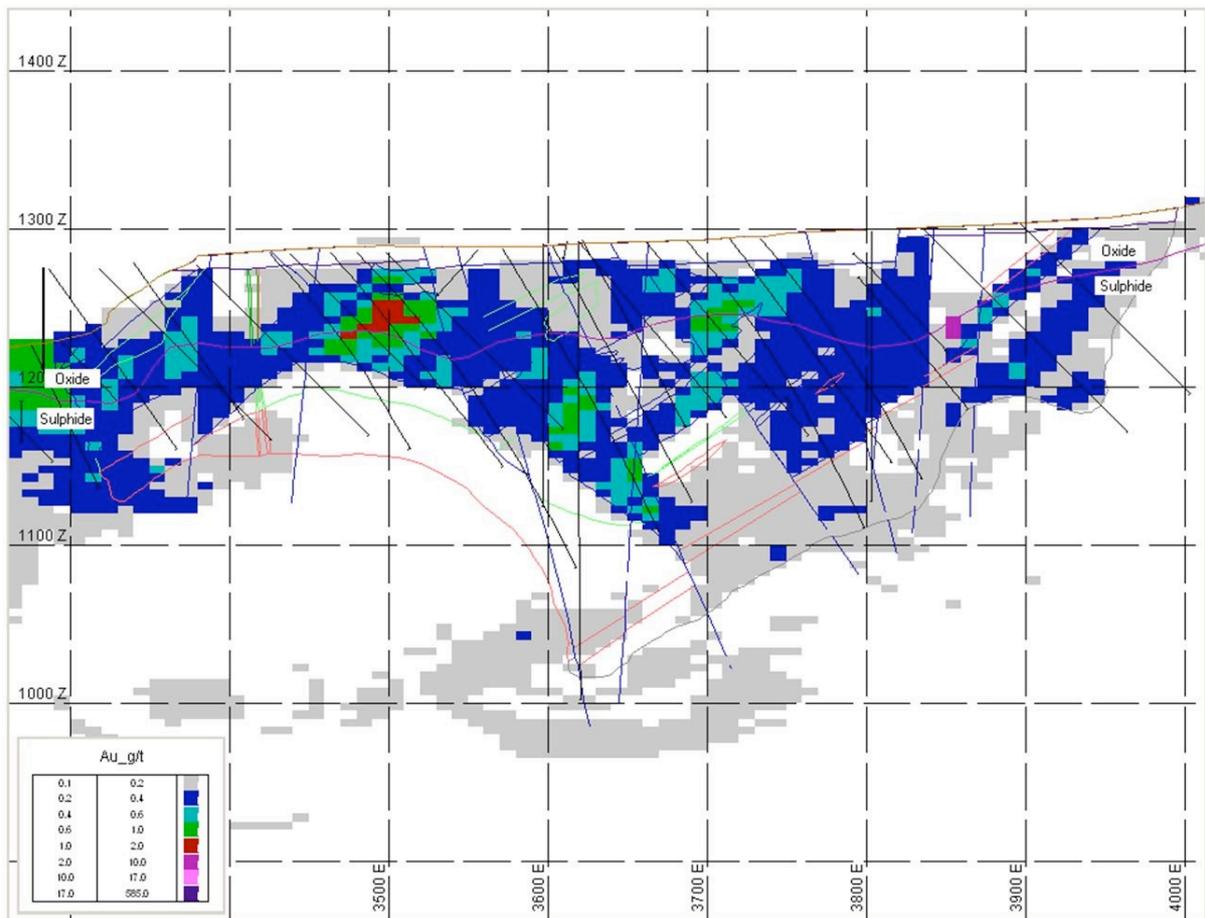
The remaining, untested parts of the Range Front target along with the Northwest, West Graben, Southwest, and South Dump targets remain valid objectives for ongoing exploration, along the lines proposed previously.

### **Facilities gold resource**

In 2008, Gary Giroux (consulting geological engineer) defined a NI 43-101-compliant, indicated resource of 49.2 million tonnes averaging 0.36 g/t Au and 6.08 g/t Ag, at a 0.20 g/t Au cutoff, on the basis of the results from 1,891 drill holes, including 77 completed during the 2006-7 program. The contained total of 0.56 Moz Au and 9.61 Moz Ag would be more than doubled if the calculated inferred resource were to be added. Notwithstanding the low-grade character of this oxide resource, it should be emphasized that several bonanza-grade gold intercepts were also identified by the drilling, including 20 ft at 32.53 g/t (0.949 oz/t)

Au and 10 ft at 53.05 g/t (1.548 oz/t) Au in reverse-circulation holes XR-07-25 and 36, respectively; these values were not systematically followed up, but could conceivably represent veins having some degree of strike and depth continuity.

Logging of drill chips and minor amounts of core, along with reinterpretation of existing drill logs, by Larry Martin provided the geologic template for this resource estimation. The main feature of the revised geologic interpretation of the Facilities area is the existence of a shallowly west-dipping, Miocene volcano-sedimentary sequence, apparently unconformable on and subparallel to the underlying Permo-Triassic meta-sedimentary basement. Within the Miocene package, a specific geologic unit of variable thickness is inferred by Larry Martin to host much of the gold mineralization, thereby accounting for its approximately tabular form (Fig. 2). This unit, dominated by partly amygdaloidal basaltic andesite, was interpreted as a debris flow. Based on cursory examination of selected core and cuttings during this visit, an interpretation as basaltic flows and associated flow breccias is preferred, although further work would be required to confirm this opinion.



Facilities Area, Section 4576200N – Gold Model

In addition to the Facilities oxide resource, aboveground resources located in Amax's four abandoned leach pads, two run-of-mine pads, and tailings impoundment are estimated by Edouard Zoutoumou (consulting metallurgist) to total 50.3 million tonnes averaging 0.44 g/t (0.013 oz/t) Au and 1.69 g/t (0.049 oz/t) Ag, amounting to 0.714 Moz Au and 2.727 Moz Ag. The Facilities and aboveground resources are the subjects of an almost-completed

preliminary economic assessment, with the objective of determining the potential viability of a modest-scale (say, 40,000 t/d) mining operation.

### **Additional low-grade gold potential**

It is clear that the Facilities gold resource is capable of appreciable expansion on the basis of step-out drilling. The most obvious additional oxide potential lies immediately north of the existing resource, beneath heap-leach pad number one. The presence there of gold mineralization is demonstrated by the results of previous drilling, which is unfortunately too widely spaced for it to have been included in the recent resource estimation. A substantial tonnage of sulfide mineralization also exists below the oxide resource, as illustrated by Figure 2.

Also of great potential interest is the breccia-stockwork style of low-grade gold mineralization throughout the Sleeper district, of which the Facilities resource is just a part. This mineralization style was partly mined as heap-leach ore from the Sleeper pit, where it enveloped the mined veins, but has also been defined elsewhere, most notably encompassing the West Wood high-grade breccia structure. There, Gary Giroux recently estimated an indicated resource of 35.1 million tonnes averaging 0.62 g/t (0.018 oz/t) Au and 3.22 g/t (0.094 oz/t) Ag, using a 0.20 g/t Au cutoff (equal to 0.7 Moz Au and 3.64 Moz Ag), a total that includes the high-grade breccia structure. Additional low-grade breccia-stockwork mineralization has been intersected in other parts of the district and may reasonably be anticipated in at least some of the currently unexplored areas as well.

This low-grade, bulk-tonnage breccia-stockwork style of gold mineralization was of little interest at the gold price prevailing during the writer's last Sleeper visit, but it clearly now demands serious consideration at gold prices of >US\$800 per oz. This fact is further emphasized by Allied Nevada's recent announcement of oxide-plus-sulfide resources at the Hycroft deposit of 798 million tonnes at 0.48 g/t (0.014 oz/t) Au and 42.86 g/t (1.25 oz/t) Ag (1.23 g/t or 0.036 oz/t Au equivalent), for totals of 11.9 Moz Au and very approximately 300 Moz Ag. As at Sleeper, this low-grade mineralization is dominated by chalcidony, pyrite, and marcasite and occurs surrounding a set of high-grade, low-sulfidation gold veins, although the latter currently remain undefined.

The appreciable (~30 %) sulfide component of the Hycroft resource might be considered of little interest, in common with many other low-grade sulfide gold resources worldwide, because of metallurgical intractability. However, a recent (12 August 2009) press release by Allied Nevada, the mine owner, revealed that preliminary flotation test work resulted in gold and silver recoveries in the high 80 % range using a coarse grind, with the concentrate being amenable to gold extraction using, for example, autoclave pressure oxidation.

In view of the apparent geologic and mineralogic similarities between the low-grade sulfide gold mineralization at Hycroft and Sleeper, and notwithstanding their ~12 million year age difference, it would clearly be worthwhile to conduct preliminary metallurgical testing of representative Sleeper material in order to determine its suitability for gold recovery via flotation. If it were, the low-grade sulfide mineralization beneath the Facilities and West Wood oxide resources as well as throughout the district would immediately become a priority exploration target. In this regard, it is worth recalling that the results of a gold endowment study undertaken by Placer Dome in 1997, using all drill data available at that

time, show that the Sleeper district might also be considered as a legitimate, large-tonnage, low-grade exploration proposition at the current gold price.

## **EXPLORATION RECOMMENDATIONS**

### **Facilities area expansion**

Upon completion of the preliminary economic assessment, it would be worthwhile to consider additional drilling to expand the Facilities and West Wood low-grade resources. At Facilities, drilling along the eastern and western sides of leach pad number one, perhaps with some of the holes angled beneath it, is considered the top priority. However, additional holes to the south of the current resource may also be necessary.

Preparatory to embarking on a pre-feasibility study, it is likely that a currently undetermined number of infill holes will be required within the Facilities resource. Some of these might be designed to determine continuity of the bonanza-grade vein intercepts. It is recommended that consideration be given to drilling selected holes using a core rig in order to obtain further information designed to better document the geologic model, because of the inherent difficulty of rock recognition in reverse-circulation chips.

### **District-scale activities**

Once adequate funding is available, potentially from revenue generated by mining and processing the Facilities and aboveground resources, a major, district-scale exploration program is recommended at Sleeper. The program might focus initially on the five target areas selected previously, namely the remainder of Range Front, Northwest, West Graben, Southwest, and South Dump (Fig. 1). As proposed previously, a formal program of fence drilling would be the recommended exploration approach.

Since the low-grade, breccia-stockwork gold mineralization encompasses the bonanza-grade veins (e.g. Sleeper) and high-grade breccias (e.g. West Wood), drilling of these targets would not only test the previously earmarked, high-grade potential, but also the possible existence of large-tonnage, low-grade mineralization. Rock volumes proximal to the Sleeper pit may also be of interest because of the likely existence of unmined, low-grade gold mineralization outboard of the previously exploited bonanza-grade veins. Furthermore, exploration of these five target areas would go a long way toward defining the true limits of the Sleeper mineralized system. Should the available funding preclude such a district-scale approach, the priority targets could be tackled one by one.

As a means of highlighting the bulk, low-grade gold potential of the Sleeper district, it is considered worthwhile to estimate the global pre-mine resource, employing the data from all available drill holes, including the blast holes drilled during the Amax mining operation. The results of such an exercise would provide an order-of-magnitude idea of the low-grade district gold potential.

As a contribution to preliminary assessment of the potential of the low-grade sulfide mineralization in the district, and bearing in mind the recent positive results announced by Allied Nevada at Hycroft, it would be advisable to carry out bench-scale flotation tests on available samples of the sulfide material as soon as reasonably possible. Suitable

representative samples might initially be obtained from the Facilities and West Wood sulfide zones.



Winnemucca, NV  
14<sup>th</sup> August 2009

Richard H. Sillitoe

A detailed description of the Sleeper Gold Project and its resources is contained in the September 2008 NI-43-101 Technical Report, which is available on SEDAR and at [www.x-cal.com](http://www.x-cal.com).

The contents of this release have been reviewed by Larry Kornze P.Eng and Larry G. Martin CPG, who are “Qualified Persons” as defined by NI-43-101. Mr. Kornze is a director of X-Cal. Mr Martin is X-Cal’s senior geologist.

Quality control and data verification consistent with good industry practice, including use of accredited labs for assays, insertion of standards and checks assays, have been carried out and are documented in detail in the NI-43-101 Technical report. Drill data attributable to Amax and Placer Dome, which preceded NI-43-101, lacks some of the required documentation. These organizations reportedly also used accredited labs and are assumed to have used sampling techniques in accordance with industry accepted protocols.

#### **Caution Concerning Forward-Looking Statements**

This release and related documents may contain certain “forward-looking statements” including, but not limited to, statements relating to interpretation of drilling results and potential mineralization, future exploration work at the Sleeper Gold Project, the Mill Creek Gold Project, the Reese River Project and the Spring Valley Area Project and the expected results of this work. Forward looking statements are statements that are not historical facts and are subject to a variety of risks and uncertainties which could cause actual events or results to differ materially from those reflected in the forward-looking statements, including, without limitation: risks related to fluctuations in gold prices; uncertainties related to raising sufficient financing to fund the planned work in a timely manner and on acceptable terms; changes in planned work resulting from weather, logistical, technical or other factors; the possibility that results of work will not fulfill expectations and realize the perceived potential of the Sleeper Gold Project, the Mill Creek Gold Project, the Reese River Project and the Spring Valley Area Project; uncertainties involved in the interpretation of drilling results and other tests; the possibility that required permits may not be obtained in a timely manner or at all; risk of accidents, equipment breakdowns or other unanticipated difficulties or interruptions; the possibility of cost overruns or unanticipated expenses in the work program; the risk of environmental contamination or damage resulting from the exploration operations at the Sleeper Gold Project, the Mill Creek Gold Project, the Reese River Project and the Spring Valley Area Project. Forward-looking statements contained in this release and related documents are based on the beliefs, estimates and opinions of management on the date the statements are made. There can be no assurance that such statements will prove accurate. Actual results may differ materially from those anticipated or projected. X-Cal Resources Ltd. and X-Cal USA, Inc. undertake no obligation to update these forward-looking statements if management’s beliefs, estimates or opinions, or other factors, should change.

**(1) Cautionary Note to U.S. Investors concerning estimates of Measured, Indicated and Inferred Resources:** This press release uses the terms “measured”, “indicated” and “inferred” “resources.” We advise U.S. investors that while these terms are recognized and required by Canadian regulations, the U.S. Securities and Exchange Commission does not recognize them. “Inferred resources” have a great amount of uncertainty as to their existence, and great uncertainty as to their economic and legal feasibility. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. Under Canadian rules, estimates of inferred mineral resources may not form the basis of a feasibility study or prefeasibility studies, except in rare cases. **U.S. investors are cautioned not to assume that any part or all of a measured, indicated or inferred resource exists or is economically or legally mineable.**

For further information contact:

**Shawn Kennedy,**

**President**

**X-Cal Resources Ltd**

Tel: (604) 662-8245 Fax: (604) 688-7740

Visit our web site: [www.x-cal.com](http://www.x-cal.com)

E-Mail: [invrel@x-cal.com](mailto:invrel@x-cal.com)