# MAR 20040011: SWAN HILLS

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# ASSESSMENT REPORT
# SWAN HILLS PROPERTY, NORTH-CENTRAL ALBERTA
# MINERAL PERMITS 9302040003 to 9302040023

Prepared for

808685 Alberta Ltd. and
Sovereign Mining and Exploration Ltd.

**Report and Figures**

**APEX Geoscience Ltd.**

March, 2005

M.B. Dufresne

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## SUMMARY

APEX Geoscience Ltd. (APEX), was retained during the spring of 1999 as consultants by Sovereign Mining and Exploration Ltd. (Sovereign) and 808685 Alberta Ltd. (808685) to prepare an independent evaluation of the gold and diamond potential of Sovereign's and 808685's Swan Hills property. The Swan Hills property comprises 30 metallic and industrial mineral permits, covering 272,832 hectares, and is located approximately 20 km west of the town of Swan Hills and about 45 km northwest of Whitecourt, Alberta. This report includes data compilation and interpretation of results from the 2002 and 2003 exploration programs, which includes systematic heavy mineral sampling of streams draining the property for gold and diamond indicator minerals during 2002, till and stream sediment sampling for gold and diamond indicator minerals during 2003, as well as rock sampling from trench pits for gold, base metals and bentonite during 2003.

A total of 326 samples were collected during the 2002 and 2003 exploration programs, which consisted predominantly of collecting stream and beach heavy mineral concentrate, rock grab, stream silt, till and drill cuttings composite samples. All of the samples were sent to the Saskatchewan Research Council (SRC) in Saskatoon, Saskatchewan where they underwent standard diamond indicator mineral and sieve gold analyses, whole rock and multielement inductively coupled plasma (ICP) analyses. Potential diamond indicator minerals picked by the SRC were subsequently sent to Tom Bonli of the University of Saskatchewan for the picked grains to be microprobed.

The 2002 and 2003 diamond indicator sampling has confirmed and extended a high quality diamond indicator anomaly from the anomalous ridge area south of Lightbulb Lake and north of the Goose River (known from previously sampling) to as far northwest as Snipe Lake. In addition, the 2002 sampling combined with the results of previous work by Ashton Mining of Canada Inc. (Ashton) has resulted in the identification of other lower priority anomalous areas including the Meekwap Lake area, and an area from Iosegun Lake east to the headwaters of Atikkamek Creek, bounded by the Sakwatamau River.

The 2002 sampling program yielded a number of high quality diamond indicator anomalies in creeks north of the Goose River draining the Lightbulb Lake Ridge that trends northwest from south of Lightbulb Lake all the way to Snipe Lake a distance of more than 50 km. The 2002 program yielded a total of 14 creek sites on the new permits and 4 sites on the old permits draining the Lightbulb Lake Ridge that yielded at least one silicate indicator mineral, and in a number of cases multiple grains, indicative of kimberlite. The new 2002 sampling in the Lightbulb Lake Ridge area also yielded a number of significant milestone geochemical results including a total of 4 borderline G10 pyrope garnets, with two of the garnets yielding 11 and 12 weight percent $Cr_2O_3$. The high chromium, low titanium G10 pyrope garnets can be diagnostic of potentially diamond bearing high-pressure peridotite mantle that was sampled and brought to surface by kimberlites in the region. Samples collected during 2002 from the Lightbulb Lake Ridge area also yielded a significant population of true low iron eclogitic garnets

that were likely derived from eclogitic mantle brought to surface in kimberlites. A total of 11 eclogitic garnets were recovered from 6 separate samples. At least one of the eclogitic garnets also yields elevated sodium with 0.06 weight percent $Na_2O$. Concentrations of $Na_2O$ greater than 0.07 weight percent in eclogitic garnets are often associated with high pressure eclogitic mantle derived from the diamond stability field. All of the samples containing eclogitic garnets were collected from drainages draining the Lightbulb Lake Ridge. In addition, all of these samples also yielded at least one or more other kimberlitic minerals such as pyrope garnet or picroilmenite. A few eclogitic garnets had been recovered during prior sampling programs but only one grain of the quality exhibited by those recovered during the 2002 program was recovered during prior sampling programs.

The recent and past results of diamond exploration in the Swan hills has resulted in the identification of a least one high priority target area for future diamond and kimberlite exploration and a couple of lower priority areas that require follow-up reconnaissance work. Follow-up sampling, prospecting, an airborne geophysical survey followed by ground geophysical surveying is considered high priority for future exploration of the Swan Hills property. The current existing airborne geophysical data covers mostly the eastern portion of the Swan Hills property; therefore, it is highly recommended that airborne geophysical data for the western portion, in particular for the Lightbulb Lake Ridge area be acquired. Based upon the fact that overburden is likely thin over most of the Swan Hills property, and the recent successful discovery of kimberlites by Ashton employing magnetic and electromagnetic surveys, strong consideration should be given to flying the entire Lightbulb Lake Ridge with a helicopter magnetic and electromagnetic survey in order to identify prospective kimberlite targets for drilling. Follow-up sampling and prospecting should be focused on the Lightbulb Lake Ridge area and the Atikkamek Ridge area and the drainages surrounding these areas, where most of the encouraging results have come from to date.

Strong consideration should be given to conducting a 5,000 line-km helicopter magnetic and electromagnetic survey over a portion of the Lightbulb Lake Ridge area. The survey cost including fuel and subcontract costs will likely be on the order of \$600,000 at an all up cost of about \$120 per line-km. Alternatively, a fixed wing Geotem survey that would also provide magnetic and electromagnetic data for kimberlite exploration could be flown at about an all up cost of about \$60 per line-km for a total cost of about \$300,000. It is strongly recommended that existing available magnetic data be acquired for the region outside of the existing Swan Hills magnetic survey. This data will help to prioritize which portion of the Lightbulb Lake Ridge area should be flown using magnetic and electromagnetic methods. Consideration should also be given to conducting a detailed creek and till sampling survey over the Lightbulb Lake Ridge and further reconnaissance sampling for diamond indicator minerals in the Iosegun Lake and Atikkamek Ridge areas. The sampling program should be conducted during late September to October in order to take advantage of partial freeze up and the resulting better access. The estimated cost to conduct such a program would be on the order of about \$200,000 including sample processing and diamond indicator analysis.

# INTRODUCTION

## Terms of Reference

APEX Geoscience Ltd. (APEX) was retained by Sovereign Mining and Exploration Ltd. (Sovereign) and 808685 Alberta Ltd. (808685) as consultants, during the spring of 1999 to conduct exploration on Sovereign's and 808685's Swan Hills property. Exploration during 1999 to 2002 is documented in previous assessment reports for Sovereign and 808685 completed by Dufresne and Copeland (2000) and Dufresne and Kim (2002). The Swan Hills property consists collectively of the original Lightbulb Lake Permit, and an additional 31 permits that were acquired during July 2000 and during early 2003. APEX personnel have been continually involved in the exploration fieldwork within Sovereign's and 808685's Swan Hills property since 1998. This evaluation has been prepared on the basis of available published and unpublished material provided by Sovereign along with several fieldwork campaigns conducted by APEX between the spring of 2000 and the late fall of 2003 at the Swan Hills property.

## Property Description, Location and Access

Sovereign and 808685 hold 30 metallic and industrial mineral permits in the Swan Hills area totalling approximately 272,832 hectares (Figures 1 and 2). The permits, collectively referred to as the Swan Hills property, and their legal descriptions are provided in Table 1. Sovereign also holds a mining lease (9496050002) in the region, the Marie's Creek property with a legal Dominion Land Survey (DLS) description of Quarter Sections 1NW, 2NE, 11SE and 12SW in Township 68, Range 15 West of the $5^{th}$ Meridian (W5-068-15: 1NW, 2NE, 11SE, 12SW). The Marie's Creek property is completed encompassed by land held by 679424 Alberta Ltd., which is part of a separate joint venture with Sovereign. The joint venture between Sovereign and 679424 Alberta Ltd., consists of a total of 26 metallic and industrial mineral permits for an approximate total of 239,616 ha east of the existing Sovereign and 808685 joint venture permits. These properties were originally staked based on the proximity of the Mountain Lake Kimberlite, the favourable geological setting and the encouraging results of preliminary prospecting by the present owners (Figure 1). The accessibility is year round via Provincial Highways 32 and 43, numerous forestry roads, cutlines and seismic lines, using four wheel drive vehicles, all terrain vehicles (ATV's) and/or snowmobiles (during winter). The Swan Hills property lies within portions of National Topographic System (NTS) 1:250 000 scale map sheets 83J, K, N, and O.

This current assessment report is being filed on permits 9302040003 to 9302040023, which are held 100% by 808685 on behalf of the joint venture. The work being reported on was conducted on these permits as well as permits 9300070004 to 9300070008, 9300080009 to 9300080011 and 9397120049, which are all contiguous and are grouped and are being grouped for the purpose of grouping expenditures.

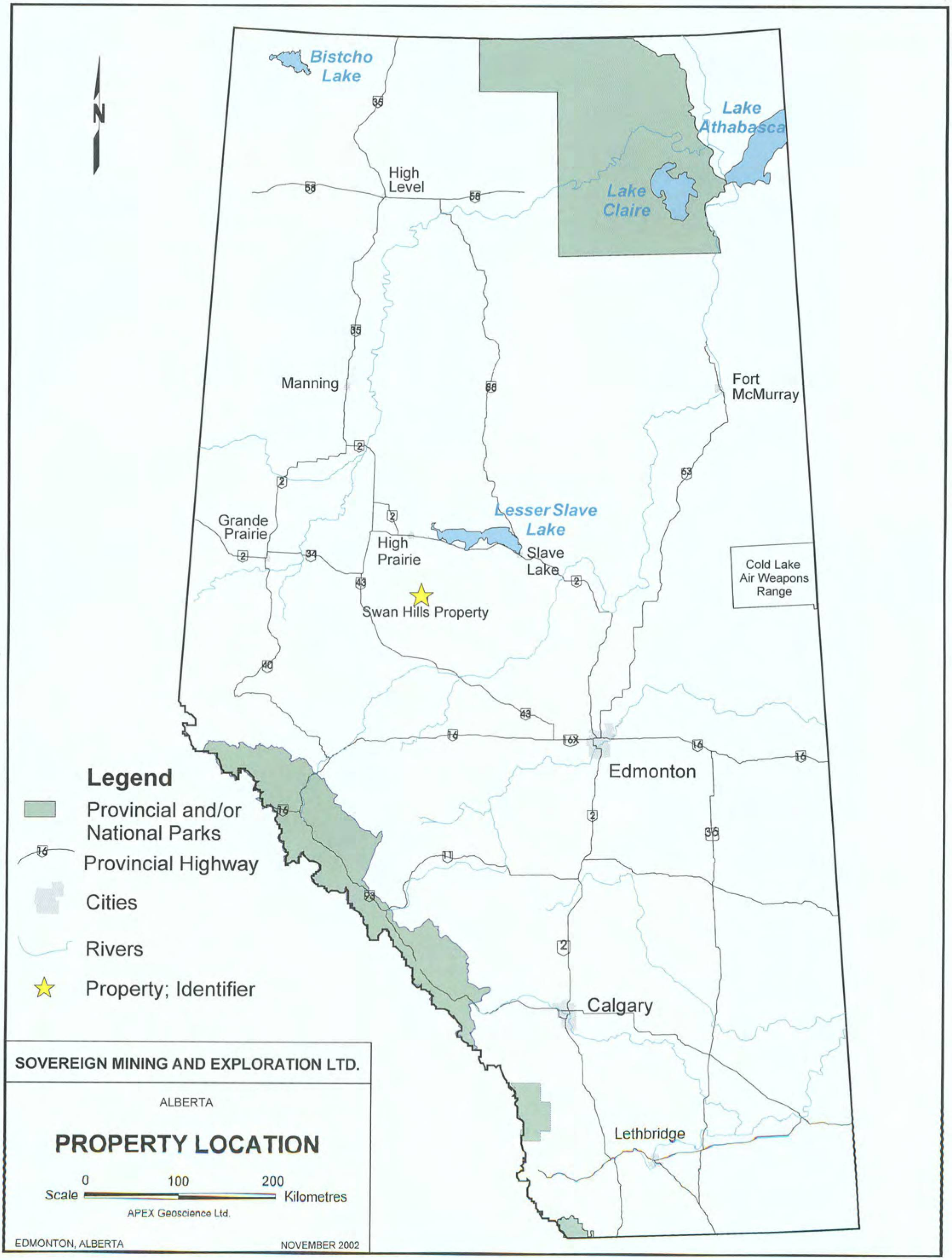
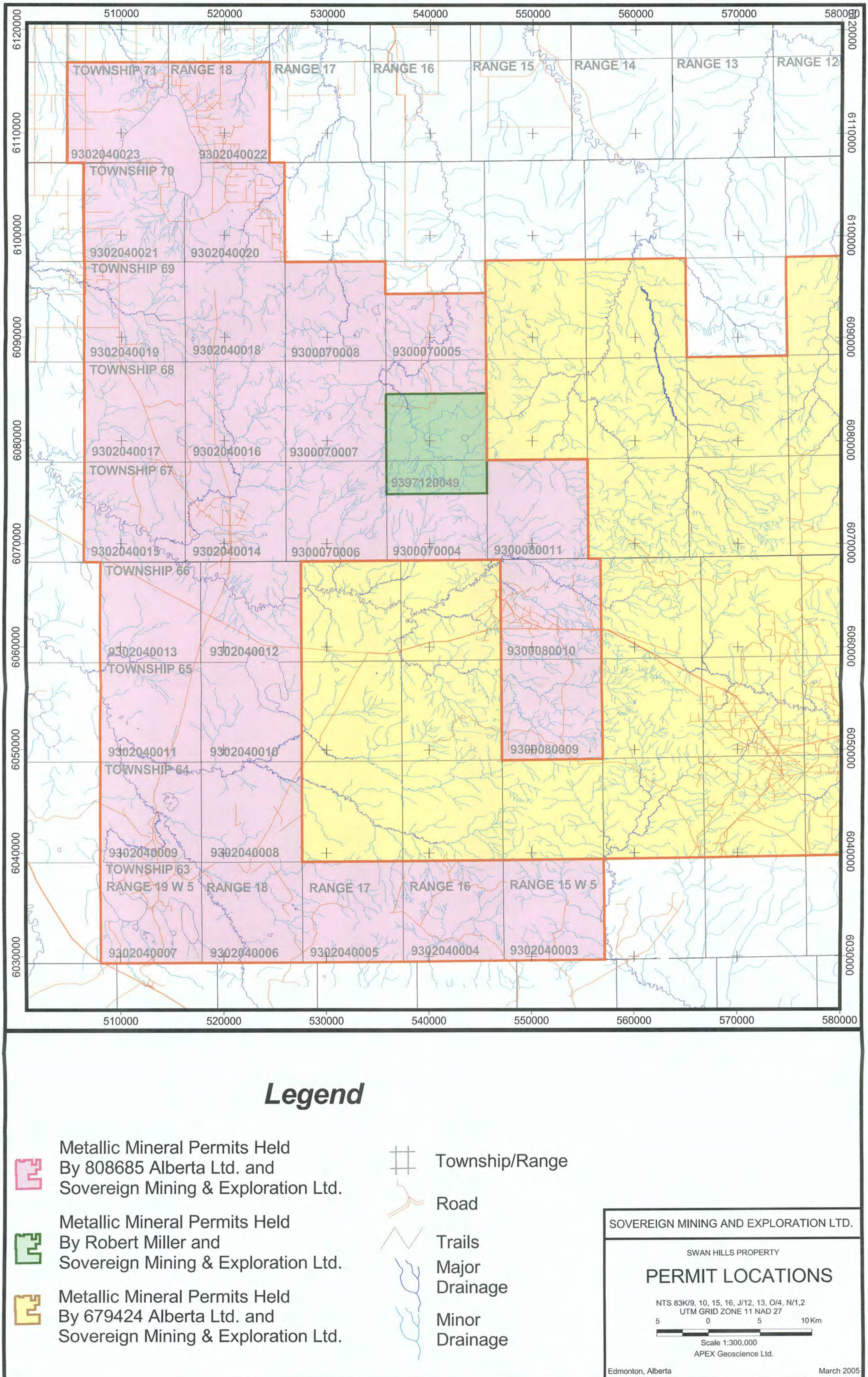

N
Bistcho Lake
Lake Athabasca
Lake Claire
High Level
Manning
Fort McMurray
Grande Prairie
High Prairie
Lesser Slave Lake
Slave Lake
Cold Lake Air Weapons Range
Swan Hills Property
Edmonton
Calgary
Lethbridge
35
58
88
2
34
43
40
16
16X
63
36
11
93
Legend
Provincial and/or National Parks
Provincial Highway
Cities
Rivers
Property; Identifier
SOVEREIGN MINING AND EXPLORATION LTD.
ALBERTA
PROPERTY LOCATION
Scale 0 100 200 Kilometres
APEX Geoscience Ltd.
EDMONTON, ALBERTA
NOVEMBER 2002

FIGURE 1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9302040012
9300080010
TOWNSHIP 65
9302040011
9302040010
9300080009
TOWNSHIP 64
9302040009
9302040008
TOWNSHIP 63
RANGE 19 W 5
RANGE 18
RANGE 17
RANGE 16
RANGE 15 W 5
9302040007
9302040006
9302040005
9302040004
9302040003
Legend
Metallic Mineral Permits Held By 808685 Alberta Ltd. and Sovereign Mining & Exploration Ltd.
Metallic Mineral Permits Held By Robert Miller and Sovereign Mining & Exploration Ltd.
Metallic Mineral Permits Held By 679424 Alberta Ltd. and Sovereign Mining & Exploration Ltd.
Township/Range
Road
Trails
Major Drainage
Minor Drainage
SOVEREIGN MINING AND EXPLORATION LTD.
SWAN HILLS PROPERTY
PERMIT LOCATIONS
NTS 83K/9, 10, 15, 16, J/12, 13, O/4, N/1,2
UTM GRID ZONE 11 NAD 27
5 0 5 10 Km
Scale 1:300,000
APEX Geoscience Ltd.
Edmonton, Alberta
March 2005

FIGURE 2.

## TABLE 1
## PROPERTY DESCRIPTION

| Permit Identifier | Permit Holder | Date Issued | Expiry Date | Size (ha) | Legal Description |
|---|---|---|---|---|---|
| 9397120049 | Sovereign & Robert Miller | 12/15/1997 | 12/15/2007 | 9,216 | 5-16-067:25–36<br>5-16-068:1-24 |
| 9300070004 | Sovereign & 808685 Ab Ltd. | 7/26/2000 | 7/26/2010 | 6,144 | 5-16-067:1-24 |
| 9300070005 | Sovereign & 808685 Ab Ltd. | 7/26/2000 | 7/26/2010 | 9,216 | 5-16-068:25-36<br>5-16-069:1-24 |
| 9300070006 | Sovereign & 808685 Ab Ltd. | 7/26/2000 | 7/26/2010 | 9,216 | 5-17-067:1-36 |
| 9300070007 | Sovereign & 808685 Ab Ltd. | 7/26/2000 | 7/26/2010 | 9,216 | 5-17-068:1-36 |
| 9300070008 | Sovereign & 808685 Ab Ltd. | 7/26/2000 | 7/26/2010 | 9,216 | 5-17-068:1-36 |
| 9300080009 | Sovereign & 808685 Ab Ltd. | 8/26/2000 | 8/26/2010 | 9,216 | 5-15-065:1-36 |
| 9300080010 | Sovereign & 808685 Ab Ltd. | 8/26/2000 | 8/26/2010 | 9,216 | 5-15-066:1-36 |
| 9300080011 | Sovereign & 808685 Ab Ltd. | 8/26/2000 | 8/26/2010 | 9,216 | 5-15-067:1-36 |
| 9302040003 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-15-063:1-36 |
| 9302040004 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-16-063:1-36 |
| 9302040005 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-17-063:1-36 |
| 9302040006 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-063:1-36 |
| 9302040007 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-063:1-36 |
| 9302040008 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-064:1-36 |
| 9302040009 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-064:1-36 |
| 9302040010 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-065:1-36 |
| 9302040011 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-065:1-36 |
| 9302040012 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-066:1-36 |
| 9302040013 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-066:1-36 |
| 9302040014 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-067:1-36 |
| 9302040015 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-067:1-36 |
| 9302040016 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-068:1-36 |
| 9302040017 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-068:1-36 |
| 9302040018 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-069:1-36 |
| 9302040019 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-069:1-36 |
| 9302040020 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 8,640 | 5-18-070:1-<br>29,32S,NE;33-36 |
| 9302040021 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-070:1-36 |
| 9302040022 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-18-071:1-36 |
| 9302040023 | Sovereign & 808685 Ab Ltd. | 04/02/2002 | 04/02/2012 | 9,216 | 5-19-071:1-36 |
| **30 permits** | | | **Total area** | | **272,832 ha** |

## REGIONAL GEOLOGY

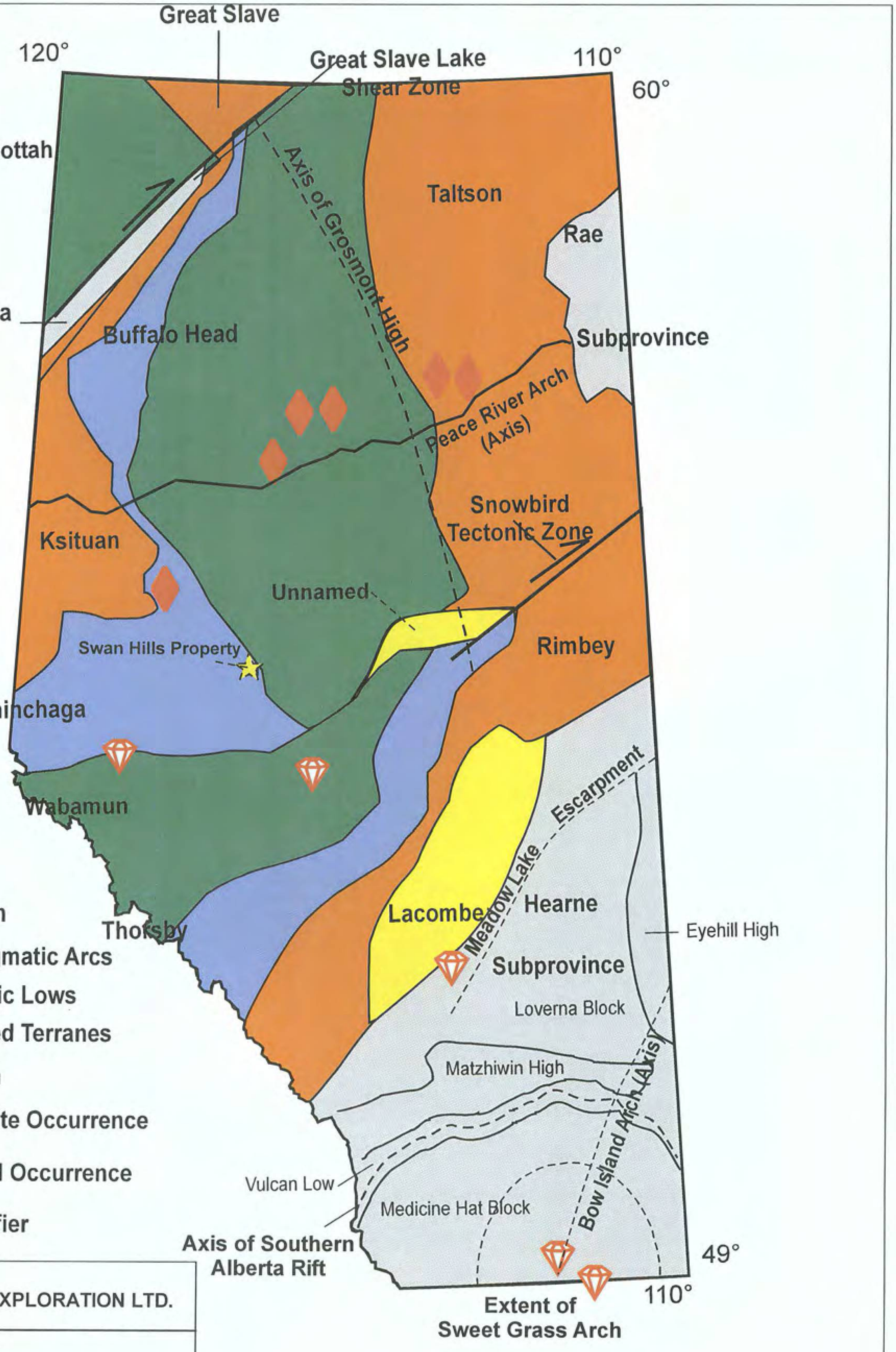
### Precambrian

The Swan Hills property lies near the centre of the Western Canada Sedimentary Basin within the southern segments of the Peace River Arch (PRA). Precambrian rocks are not exposed within the permit areas. The basement underlying the PRA comprises several terranes including the Buffalo Head and the Chinchaga Low (Figure 3), both of which are thought to have been accreted to the western edge of North America between 1.8 and 2.4 billion years (Ga) ago and collectively form the Buffalo Head Craton (Ross *et al.*, 1991, 1998). Due to the presence of thick crust, potentially Archean protolith and their relatively stable history since accretion, the Buffalo Head and Chinchaga terranes are currently the focus of extensive diamond exploration in northern Alberta.

The area underlying the permits straddles the boundary between two basement terranes, the Buffalo Head Terrane (BHT) to the east and the Chinchaga Low to the west (Figure 3). The BHT is an area of high positive magnetic relief with a north to northeasterly trending fabric (Villeneuve *et al.,* 1993). Ashton Mining of Canada Inc.'s (Ashton) diamondiferous kimberlites are underlain by basement of the BHT. Part of the Churchill Structural Province (Rae Subprovince), the BHT may represent either Archean crust that has been thermally reworked during the Hudsonian (Proterozoic) Orogeny (Burwash *et al.*, 1962; Burwash and Culbert, 1976; Burwash *et al.*, 1994) or an accreted Proterozoic terrane that may or may not have an Archean component (Ross and Stephenson, 1989; Ross *et al.*, 1991; Villeneuve *et al.*, 1993). Precambrian rocks intersected in drill core from the BHT comprise felsic to intermediate metaplutonic rocks, felsic metavolcanic rocks and high-grade gneisses (Villeneuve *et al.*, 1993).

The Chinchaga Low is a prominent, curvilinear, westward convex aeromagnetic low, which is concordant with the outline of the BHT to the east (Villeneuve *et al.*, 1993). Drill core taken from the basement in the region comprise metaplutonic and metasedimentary gneisses of comparable age to that of the BHT. In comparison to the BHT, the Chinchaga Low appears to be devoid of either an aeromagnetic or gravity gradient fabric. The boundaries of the Chinchaga Low show no gravity gradient from the surrounding terranes.

The presence of numerous eclogitic garnets, eclogitic pyroxenes and chromium-bearing corundums in association with kimberlites or related intrusions in northern Alberta may indicate the presence of a significant volume of accreted and subducted oceanic basalt and sedimentary protolith in the lower crust and/or upper mantle beneath the BHT and the Chinchaga Low. Seismic refraction and reflection studies indicate that the crust in the Iosegun Lake region is likely between 35 to 40 km thick, a trait favourable for the formation and preservation of diamonds in the upper mantle (Dufresne *et al.,* 1996).




SOVEREIGN MINING AND EXPLORATION LTD.

ALBERTA

## BASEMENT GEOLOGY

Scale 0 100 200 Kilometres

APEX Geoscience Ltd.

EDMONTON, ALBERTA NOVEMBER 2002

(Modified after Ross *et al.*, 1991)

Figure 3

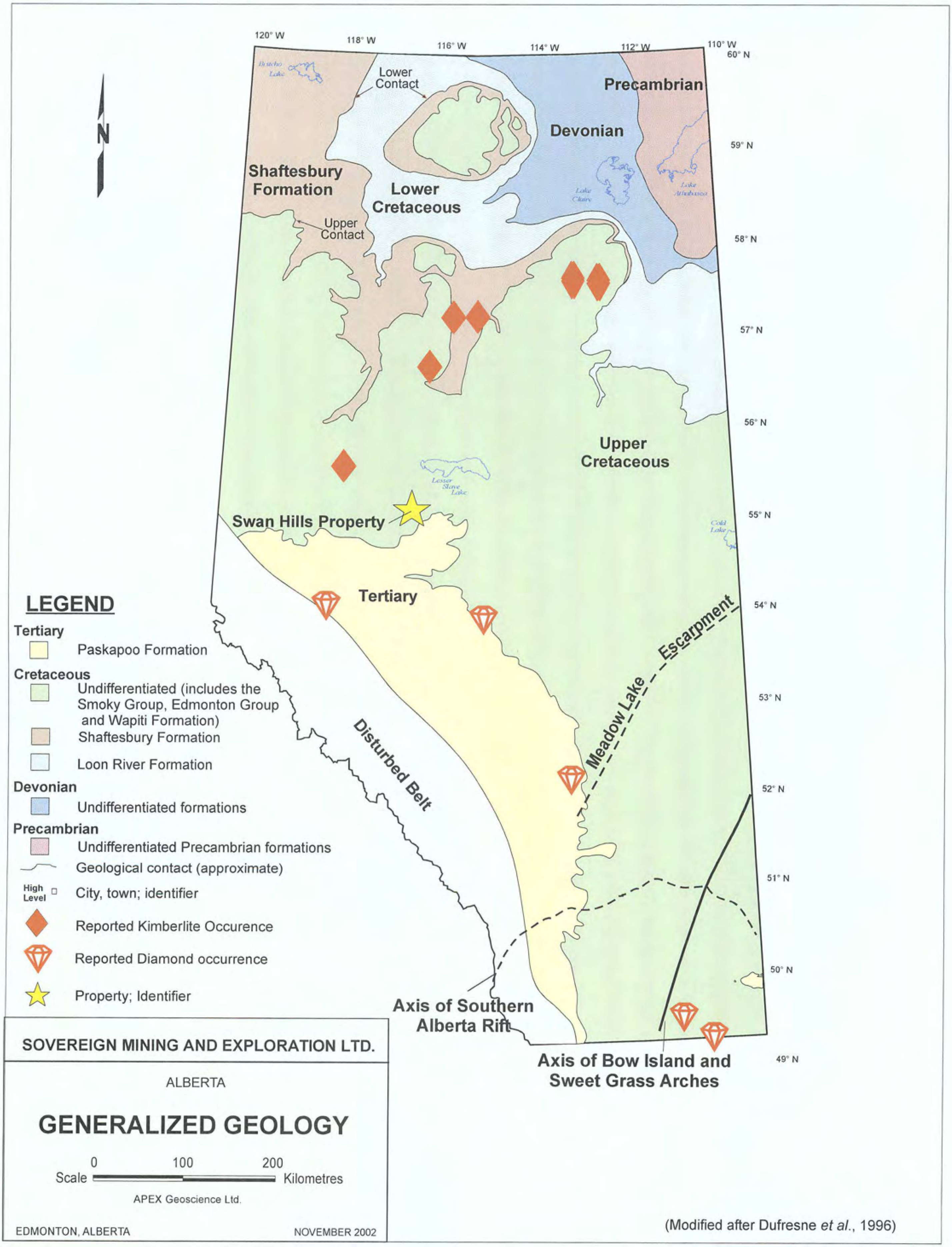
## Phanerozoic

Overlying the basement in the Swan Hills region is a thick sequence of Phanerozoic rocks comprised mainly of Cretaceous sandstones and shales near surface and Mississippian to Devonian carbonates and salts at depth (Glass, 1990). Bedrock exposures within the permit block are common along river and stream cuts and topographic highs. Further information pertaining to the distribution and character of these and older Phanerozoic-aged units can be obtained from well log data in government databases and various geological and hydrogeological reports (Green *et al.*, 1970; Tokarsky, 1977; Glass, 1990; Mossop and Shetson, 1994).

Underlying the near surface Cretaceous units in the area is a thick succession of Devonian to Mississippian carbonates, calcareous shales and salt horizons (Mossop and Shetson, 1994). Several of the Devonian carbonate units form the Swan Hills Reef Complex, which may be related to the Grosmont Reef Complex, a large structure that extends in a northwesterly direction from east of Lesser Slave Lake to the N.W.T. (Bloy and Hadley, 1989). Both the Grosmont and the Swan Hills Reef complexes are likely the result of tectonic uplift or down warping along large-scale arches or rifts during the Devonian. These structures, in conjunction with the PRA, may have played a significant role in the localization of faults and other structures that could have provided favourable pathways for kimberlite volcanism.

The Cretaceous strata underlying Sovereign's permits are composed of alternating units of marine and nonmarine sandstones, shales, siltstones, mudstones and bentonites (Figure 4). The regional stratigraphy of the Swan Hills area is summarized in Table 2. The oldest documented units exposed in the permit area belong to the Wapiti Formation, a sequence of Upper Cretaceous sandstones with minor siltstones and conglomerates. It is possible that older units from the top of the Smoky Group may be exposed locally along the West Prairie River.

The Shaftesbury Formation is lower Upper Cretaceous in age and is comprised of marine shales with fish-scale bearing silts, thin bentonitic streaks and ironstones. The upper contact is conformable and transitional with the Dunvegan Formation, where the Dunvegan Formation is present. Evidence of extensive volcanism during deposition of the Shaftesbury Formation exists in the form of numerous bentonitic horizons throughout the formation, especially within and near the Fish Scales Horizon (Leckie *et al.*, 1992; Bloch *et al.*, 1993). The deposition of the Shaftesbury Formation is chronologically correlative with the deposition of the Crowsnest Formation volcanics of southwest Alberta (Olson *et al.*, 1994; Dufresne *et al.*, 1995) and with kimberlitic volcanism near Fort à la Corne in Saskatchewan (Lehnert -Thiel *et al.*, 1992; Scott Smith *et al.*, 1994).


120° W
118° W
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114° W
112° W
110° W
60° N
59° N
58° N
57° N
56° N
55° N
54° N
53° N
52° N
51° N
50° N
49° N
N
Lower Contact
Precambrian
Devonian
Shaftesbury Formation
Lower Cretaceous
Upper Contact
Upper Cretaceous
Swan Hills Property
Tertiary
Meadow Lake Escarpment
Disturbed Belt
Axis of Southern Alberta Rift
Axis of Bow Island and Sweet Grass Arches
LEGEND
Tertiary
Paskapoo Formation
Cretaceous
Undifferentiated (includes the Smoky Group, Edmonton Group and Wapiti Formation)
Shaftesbury Formation
Loon River Formation
Devonian
Undifferentiated formations
Precambrian
Undifferentiated Precambrian formations
Geological contact (approximate)
High Level
City, town; identifier
Reported Kimberlite Occurence
Reported Diamond occurrence
Property; Identifier
SOVEREIGN MINING AND EXPLORATION LTD.
ALBERTA
GENERALIZED GEOLOGY
0
100
200
Scale
Kilometres
APEX Geoscience Ltd.
EDMONTON, ALBERTA
NOVEMBER 2002
(Modified after Dufresne et al., 1996)

Figure 4

**TABLE 2**
**REGIONAL STRATIGRAPHY FOR THE SWAN HILLS AREA**

| SYSTEM | GROUP | FORMATION | AGE* (MA) | DOMINANT LITHOLOGY |
|---|---|---|---|---|
| Pleistocene | | | Recent | Glacial till and associated sediments. |
| Tertiary | | | 6.5 to Recent | Pre-glacial sand and gravel. |
| Upper Cretaceous | | Wapiti | 70 to 80 | Sandstones and minor siltstone with conglomerates. |
| | Smoky | Puskwaskau | 75 to 86 | Thinly bedded dark marine shales, ironstone, First White Specks. |
| | | Badheart | 86 to 88 | Sandstone. |
| | | Kaskapau | 88 to 92 | Marine fossiliferous shale, Second White Specks. |
| | | Dunvegan | 92 to 95 | Marine, non-marine and deltaic sandstones. |
| | Fort St. John | Shaftesbury | 95 to 98 | Friable dark marine shales with bentonitic layers; Fish Scale Zone. |

*Ages approximated from Green *et al.*, (1970), Glass, (1990), Dufresne *et al.* (1996) and Leckie *et al.* (1997).

Deltaic to marine, feldspathic sandstones, silty shales and laminated carbonaceous siltstones characterize the Dunvegan Formation. The unit is overlain conformably by shales of the Kaskapau Formation of the Smoky Group. It should be noted that the Ashton pipes exist just above or near the contact between the Kaskapau and the Dunvegan formations (Dufresne *et al.*, 1995).

The Smoky Group is Upper Cretaceous in age and is comprised of thinly bedded, marine, silty shale with occasional ironstone and claystone nodules and thin bentonite streaks. The group is divided into three formations: (a) a lower shale unit, Kaskapau, which includes the Second White Specks marker unit (SWS); (b) a middle sandstone, named the Badheart; and, (c) an upper shale, Puskwaskau, which contains the First White Specks marker unit. The Kaskapau Formation contains abundant ammonite fossils and concretions. In addition, foraminifera are present in the lower arenaceous units (Glass, 1990). Exposures of the Smoky Group, if present, will be limited to river and stream cuts. There is strong evidence of volcanism associated within the depositional time span of the Smoky Group in the vicinity of the PRA (Auston, 1998; Carlson *et al.*, 1998). Ashton's recently discovered Buffalo Head Hills kimberlites yield emplacement ages of 86 to 88 Ma (Auston, 1998; Carlson *et al.*, 1998). In addition, kimberlites discovered in the Birch Mountains by Kennecott Canada Exploration Inc. (Kennecott) in a joint venture with Montello Resources Ltd. (Montello) and Redwood Resources Inc. (Redwood) are reported to yield emplacement ages of about 82 Ma.

These volcanic events would have taken place during deposition of the Smoky Group sedimentary succession.

The youngest unit underlying the Swan Hills mineral permits is the Late Campanian to Early Paleocene Wapiti Formation (Figure 4). The Wapiti Formation is primarily composed of medium to coarse-grained, feldspathic, argillaceous to carbonaceous sandstones interbedded with siltstones and silty shale (Chu, 1978; Glass, 1990). Thin and laterally discontinuous coal seams may be present. In addition, some of the sandstones and shales may be bentonitic. The Wapiti Formation in this region is thick, often exceeding several hundred metres. Outcropping Wapiti Formation is common along river and stream cuts and on topographic highs throughout the property. The Wapiti Formation is of particular exploration interest in this area because of its chronological and stratigraphic relationship to the Mountain Lake Kimberlite, located about 75 km west of High Prairie (Dufresne and Copeland, 2000). Although, the Mountain Lake Kimberlite is reported to be highly altered and poorly diamondiferous (Leckie *et al.*, 1997), its presence in the Wapiti Formation with an intrusion date of somewhere between 69 and 75 Ma is significant as it indicates the presence of kimberlitic magmatism coeval with the deposition of Wapiti Formation sediments. An age of 70 Ma has also been reported for one of Montello-Kennecott kimberlites in the Birch Mountains. If kimberlites of similar age to the Mountain Lake Kimberlite exist within the Swan Hills mineral permits they would be relatively near surface.

**Late Tertiary – Quaternary**

Data and information about the surficial geology in central to northern Alberta is sparse and regional in nature. Prior to continental glaciation during the Pleistocene, most of Alberta, including the Iosegun Lake region, had reached a mature stage of erosion. The Swan Hills drained into large, broad, northeasterly flowing paleochannels and their tributaries northwest of the region (Dufresne *et al.*, 1996). Fluvial sand and gravel was deposited pre-glacially in these channels. The exact age of these channels is uncertain.

Several of the topographic highs in the Swan Hills region are capped by pre-glacial gravel deposits of probable Late Tertiary age (Klassen, 1989). The exact age of the unit is uncertain due to a scarcity of data. Containing no evidence of glacial origin, this unit is comprised of fine to coarse-grained sand and quartzite pebble-gravel derived from the Cordillera. Typically thin, less than 10 m, and discontinuous, the sand and gravel unit may be remnants resulting from erosion and river incision associated with uplift of the PRA or some other local tectonic feature underlying the Swan Hills.

During the Pleistocene, multiple southwesterly and southerly glacial advances of the Laurentide Ice Sheet across the region resulted in the deposition of ground moraine and associated sediments in northern Alberta (Dufresne *et al.,* 1996). The advance of glacial ice may have resulted in the erosion of the underlying substrate and modification of bedrock topography. Dominant ice flow directions within the Swan Hills property appear to be topographically controlled, following the contours of the Swan Hills. It is uncertain whether thick continental ice covered the Swan Hills completely. The presence of Tertiary gravels at topographic highs within the Swan Hills just east of the permit areas, the thinness of the drift cover, and the lack of glacial erosional features such grooves or flutes may indicate that glacial erosion was not as prevalent or strong as initially anticipated. Hummocky supraglacial and meltout till plains with associated small, localized organic deposits are prevalent in depressional areas and at lower elevations in the Swan Hills region.

Glacial ice is believed to have receded from the area between 15,000 and 10,000 years ago. After the final glacial retreat, lacustrine clays and silts were deposited in low-lying regions along with organic sediments. Drainage regimes previously re-routed due to glaciation, re-established drainage patterns similar to that of the pre-Pleistocene. Alluvial deposits in the form of channel bars and floodplains are present along portions of the West Prairie River. Extensive colluvial sediments accompanied post-glacial river and stream incision.

The majority of the Swan Hills property is covered by drift of variable thickness, ranging from a discontinuous veneer to less than 15 m (Pawlowicz and Fenton, 1995a,b). Bedrock may be exposed locally, in areas of higher topographic relief. Unfortunately, local drift thickness for the properties cannot be easily delineated due to the scarcity of publicly available hydrogeological data for the region. Limited general information regarding bedrock topography and drift thickness in northern Alberta is available from the logs of holes drilled for petroleum, coal or groundwater exploration and from regional government compilations (Mossop and Shetson, 1994; Pawlowicz and Fenton, 1995a,b; Dufresne *et al.*, 1996).

## Structural Geology

In north-central Alberta, the PRA is a region where the younger Phanerozoic and Cenozoic rocks, which overlie the Precambrian basement, have undergone periodic vertical and, possibly, compressive deformation from the Proterozoic into Tertiary time (Cant, 1988; O'Connell *et al.*, 1990; Dufresne *et al.*, 1995, 1996). This pattern of long-lived, periodic uplift and subsidence has imposed a structural control on the deposition patterns of the Phanerozoic, and to a lesser extent the Cenozoic, strata in northern Alberta. In addition, this periodic movement has resulted in a rectilinear pattern of faults that not only is responsible for structurally controlled oil and gas pools, but may have provided potential pathways for later deep-seated intrusive kimberlitic magmas.

There is a well-documented northwest trending $\delta O^{18}$ alteration feature in the basement rocks beneath the Swan Hills property near or along the eastern boundary of the Chinchaga Low (Muehlenbachs *et al.*, 1993 and 1994). This feature lies in close proximity to the properties and potentially may indicate that an important deep-seated structure may underlie the properties. This type of a structure, as evidenced by the presence of the Mountain Lake Kimberlite near or along the western edge of the Chinchaga Low and several of the Buffalo Head Hills Kimberlites along the western edge of the Grosmont High, may have played a critical role in determining whether kimberlites reached surface in the vicinity of the properties during the Phanerozoic.

During the mid-Cretaceous and Early Tertiary, compressive deformation occurred as a result of the orogenic event that eventually led to the formation of the Rocky Mountains. The PRA was emergent during this period resulting in the reactivation of many prominent basement faults. The Phanerozoic rocks beneath the Swan Hills property lie along the southern edge of the PRA and are underlain by and proximal to basement faults that may also be related to the Swan Hills Reef Complex (Bloy and Hadley, 1989; Dufresne *et al.*, 1996). There is strong evidence that basement faults manifested in the overlying Phanerozoic sedimentary succession may have controlled the emplacement of the Mountain Lake Kimberlite and the Buffalo Head Hills Kimberlites northwest and north of the properties (Dufresne *et al.*, 1996; Leckie *et al.*, 1997). It is unclear whether the kimberlites discovered to date show any spatial relationship to structures in the underlying basement and/or Phanerozoic succession. However, structures observed proximal to the two properties resulting from tectonic activity associated with movement along the PRA or even along contacts between different basement terranes could be pathways for kimberlitic volcanism.

## PREVIOUS EXPLORATION

During the summer of 1997, Teuton Resource Corp. (Teuton) conducted a reconnaissance till sampling program on their Swan Hills mineral permits, of which a portion of it is currently included in Sovereign's Swan Hills property (Kruchkowski, 2000). During the spring of 1998, Spectra Exploration Geoscience Corp. (Spectra) flew a high-resolution airborne magnetic (HRAM) survey on Teuton's mineral permits (Kruchkowski, 2000). The airborne survey was then reviewed and interpreted by APEX, on behalf of Teuton (Dufresne and Chin, 1998). Then in late 1998, Teuton conducted ground geophysics on seven high priority magnetic anomalies that were picked and prioritised by APEX personnel (Kruchkowski, 2000). Teuton has since relinquished all of its land holdings in the region.

The first field visit to Sovereign's Swan Hills property by APEX personnel, which at that time only included the Lightbulb Lake and Marie's Creek permits, was conducted during the fall of 1998 (Chin, 1998). During March of 1999, a high-resolution airborne magnetic (HRAM) survey, flown at a drape altitude of 100 m above surface with east-west traverse lines at a spacing of 100 m and north-south control lines every 1000 m, was flown over the Lightbulb Lake permit. The survey was completed by Spectra and covered the Lightbulb Lake and Marie's Creek permits (Spectra, 1999). The data collected from the HRAM survey was reviewed by APEX and interpreted for magnetic anomalies potentially indicative of kimberlites or related intrusions (Dufresne and Copeland, 2000). Magnetic anomalies were chosen and rated based upon similar magnetic characteristics to those of Ashton's Buffalo Head Hills Kimberlites, Monopros Ltd.'s Mountain Lake Kimberlite and other kimberlites or associated intrusive rocks in the Western Canada Sedimentary Basin of Alberta and Saskatchewan. A total of ten airborne magnetic anomalies from within the Lightbulb Lake permit were initially selected and ranked for follow-up exploration, based on anomaly intensity, anomaly shape, noise levels and presence of topographic features or culture (Chin, 1999; Dufresne and Copeland, 2000). Of these ten anomalies, four were classified as moderate priority and six as low priority anomalies. With further review of the data, a number of other low to moderate priority anomalies were added. In addition, the HRAM data yielded a prominent east to slightly east-northeast trending magnetic lineament corresponding to a prominent ridge along the southern boundary of the Lightbulb Lake permit (Dufresne and Copeland, 2000).

During June and September of 1999, APEX conducted systematic till, soil, stream and rock grab sampling on behalf of Sovereign within the Lightbulb Lake and Marie's Creek permits. A total of 21 till samples, approximately 25 kg each, were collected down-ice of magnetic anomalies and along the southern boundary of the permit areas. A total of 47 stream silt and 47 screened heavy mineral concentrate (HMC) samples, each about 10 kg, were collected from regions proximal to airborne magnetic anomalies for diamond indicator minerals (DIMs), particulate gold grains and trace metal geochemistry. One hundred and fourteen soil samples were collected over or across three of the discreet aeromagnetic anomalies and at the southwest trending magnetic lineament at the south end of the Lightbulb Lake permit. Finally, a total of 13 rock grab samples were collected from areas of outcropping Cretaceous sedimentary rocks. All the samples, with the exception of the soil samples, were sent to the Saskatchewan Research Council (SRC) in Saskatoon, Saskatchewan for a variety of analyses. The soil samples were processed and analyzed by Activation Laboratories Ltd. (Activation) in Ancaster, Ontario (Dufresne and Copeland, 2000).

The sampling conducted between June and September 1999, resulted in the discovery of a large number of DIM anomalies on the Lightbulb Lake permit, the majority of which were comprised of chromites (Dufresne and Copeland, 2000). Diamond indicator mineral analysis of till and stream HMC samples from the Lightbulb Lake and Marie's Creek permit areas yielded widespread high magnesium chromites that are often associated with kimberlites or related intrusions. Only 8 of 51 HMC samples did not yield chromites, and it was estimated that more than 30 of the samples would contain greater than 10 chromites if the concentrates were fully picked. Dufresne and Copeland (2000) indicate that of the chromites that were recovered within the Lightbulb Lake permit area, only a few might be truly diagnostic of kimberlite or lamproite volcanism. Fipke *et al.* (1995) indicate that only chromites with greater than 40 weight percent (wt%) $Cr_2O_3$ and greater than 2 wt% $TiO_2$ are unique to kimberlites and lamproites. Dufresne and Copeland (2000) indicate that a large number of the Lightbulb Lake chromites are similar in character to mantle derived chromites with high Cr, high Mg and low Ti. In fact they suggest that several of the chromites recovered compare favourably to the high Cr and high Mg chromites that are found as inclusions in diamonds (the diamond inclusion field). Therefore, Dufresne and Copeland (2000) concluded that it is possible that some of the chromites may be derived from mantle that was formed within the diamond stability field and may have contained diamonds. However, they concluded also that similar to the magmatic chromites, the source of the mantle chromites is not easily identifiable based upon the widespread distribution of the chromites and the lack of associated abundant silicate indicator minerals such as pyrope garnet, chrome diopside and olivine. Chromites tend to be the longest surviving of the suite of DIMs and can be preserved through multiple periods of recycling, travelling large distances in river, delta and beach systems. The silicate DIMs tend to not survive multiple cycles of erosion or large distances of travel and are a better indication of proximity to source.

Dufresne and Copeland (2000) point out that large numbers of chromites have been encountered in the foothills region of western Alberta but almost exclusively restricted to areas of Upper Cretaceous sedimentary rocks and areas influenced by Cordilleran glacial events. This is the first known occurrence of large volumes of chromites that have been encountered well east of the Foothills in an area dominantly influenced by Continental glaciation. Dufresne and Copeland concluded that based upon the widespread distribution of the chromites recovered from the till and HMC samples, it is likely that the chromites are derived from either the Cretaceous Wapiti Formation or from the pre-glacial Swan Hills gravels that cap many of the upland areas within the Swan Hills. Most of the pre-glacial gravel deposits have largely escaped or have been only moderately affected by glaciation. Chromites contained within the Cretaceous Wapiti Formation or within the Swan Hills gravels could be originally sourced either locally from kimberlites or related intrusions, which could exist in the region or are some distance away, or through recycling of sedimentary successions from the Rocky Mountains. Because of the distance involved to recycle chromites from intrusions in the Rocky Mountains, derivation from more local source areas is the more favoured alternative.

As well as the DIM anomalies, particulate and geochemical gold anomalies as well as a few pathfinder element anomalies were discovered with no clear indication of either kimberlites, sulphides or alteration zones on the Lightbulb Lake permit (Dufresne and Copeland, 2000). Heavy mineral concentrate samples, recovered from the southwest corner of the Lightbulb Lake permit and draining a prominent ridge, yielded the highest number of particulate gold grains encountered by APEX geologists in Alberta sampling programs to date. A number of HMC samples from the area yielded counts ranging from 400 up to about 1,200 particulate gold grains. Soil geochemical anomalies were encountered on several of the grids overlying airborne magnetic anomalies and along profiles across the upland ridge along the southern boundary of the permit area. Further overburden and bedrock sampling was recommended to clarify the relationship between soil geochemical anomalies and the magnetic anomalies. It was further recommended that additional tightly spaced and systematic soil sampling be done to outline areas of mineralization underlying the southern ridge (Dufresne and Copeland, 2000).

Despite the limited number of rock samples collected during reconnaissance sampling, a few samples yielded anomalous concentrations of elements such as arsenic (As), antimony (Sb) and tellurium (Te) (Dufresne and Copeland, 2000). Other geochemical results of interest include the discovery of ironstone with up to 52.2 wt% total Fe as $Fe_2O_3$ along the southwest trending ridge at the south end of the Lightbulb Lake permit (Dufresne and Copeland, 2000). Because of the scarcity of outcrop and the present limitation in the understanding of the stratigraphy underlying the permit area, it was recommended that some form of cost effective drilling be performed to collect further bedrock samples in order to determine the source and the origin of the ironstone and gold. None of the rock samples collected to date indicated derivation from a kimberlitic or mantle parent (Dufresne and Copeland, 2000).

Detailed ground geophysical surveying over selected priority airborne magnetic anomalies within the properties was conducted during January 2000 by APEX. Four grids with 100 m line spacing were constructed with station readings taken every 25 m. The surveyed grids totalled 3 line-km over an area of approximately 500 m squared. The magnetic surveys over anomalies A6 and A20 were successful in delineating two of the airborne magnetic anomalies, although none were attributed to kimberlite diatremes (Dufresne and Copeland, 2000). Further work was recommended for the two magnetic anomalies.

Exploration within the Swan Hills property during the fall of 2000 consisted mostly of regional till, stream and rock grab sampling as the number of mineral permits were increased, emphasis was placed on certain areas for sampling based on: (1) previously unsampled areas; (2) existing geochemical anomalies; (3) existing DIM anomalies; (4) existing HRAM anomalies from data reviewed in publicly available assessment reports; and (5) geologically favourable areas. Consequently, sampling was targeted primarily along the Goose River, Atikkamek Creek, Wallace River and West Prairie River drainage systems (Dufresne and Kim, 2002). Follow-up exploration was conducted during the fall of 2001, as recommended from the outcome of the 2000 sampling program. This included semi-detailed to reconnaissance HMC and stream silt sampling near anomalous samples sites identified from the 2000 fall exploration; in particular, a number of the tributaries near the headwaters of the Goose River and Atikkamek Creek (Dufresne and Kim, 2002). A total of 220 samples were collected during the 2000 and 2001 exploration programs (131 and 89 samples, respectively), which consisted of HMC, rock grab, stream silt and till samples (Dufresne and Kim, 2002).

Two drilling programs were conducted on the Swan Hills property during March 2000 and February 2001. The 2000 drilling, completed by Canadian Geological Drilling Ltd. (Canadian Geological), consisted of auger and hollow-stem auger drilling, as well as one back-hoe excavation. The locations for the auger drillholes were chosen based upon their location with respect to magnetic targets A3, A20, the ridge at the southwest portion of the Lightbulb Lake permit and the ease of accessibility (Dufresne and Kim, 2002).

Aggressive Diamond Drilling Ltd. (Aggressive Drilling) conducted the 2001 drilling program, which consisted of diamond drilling magnetic anomaly A3, one of the higher priority magnetic anomalies from the 1999 Spectra HRAM survey that was ground geophysically surveyed (Dufresne and Copeland, 2000), and the prominent easterly trending ridge located in the southern portion of the Lightbulb Lake permit (9397120049) and the northern portion of permit 9300070004 (Dufresne and Kim, 2002). This ridge was targeted based upon the large number of DIM's and particulate gold grains that obtained in HMC samples collected from immature creeks draining the ridge.

The 2000 and 2001 sampling programs, which were composed of semi-detailed to reconnaissance stream sediment sampling across the Swan Hills property, resulted in the identification of several new kimberlite indicator mineral grain anomalies across the western half of the Swan Hills Property (Dufresne and Kim, 2002). The diamond indicator results for the 220 samples collected from the Swan Hills property during the 2000 and 2001 sampling programs resulted in the delineation of four main anomalous drainage areas containing diamond indicator minerals, comprised principally of one or more of pyrope garnet, eclogitic garnet, chrome diopside or picroilmenite: (1) Goose River; (2) Atikkamek Creek; (3) West Prairie River; and (4) Wallace and East Prairie Rivers (Dufresne and Kim, 2002). Regional sampling from both the 2000 and 2001 exploration programs yielded a total of 27 pyrope garnets, 11 chrome diopsides, 6 eclogitic garnets and 2 olivines, 11 chrome grossular garnets, 8 picroilmenites and 707 chromites (Figure 8; Appendix 2). Total microprobe confirmed chromites and picroilmenites for all of the surface sampling conducted to date on the Swan Hills property are displayed on Figure 7. Overall, it is quite evident that chromite is abundant and widespread throughout the Swan Hills property with less than 10 samples yielding no chromites. The picroilmenites are much less abundant and they show a strong correlation to samples and/or drainages that also yield either pyrope garnets, eclogitic garnets or chrome diopsides (Dufresne and Kim, 2002). The maximum number of chromites that were microprobe confirmed for one sample is 62 grains in sample 0ANH002 (Dufresne and Kim, 2002). However, it should be noted that in most cases only a small portion of the oxide concentrate for most samples was picked for possible chromites and that if the entire oxide concentrate had been picked for all of the anomalous samples that many of the samples would likely have yielded hundreds of chromites. A large number of pyrope garnets were recovered from a number of creeks in the vicinity of the Goose River with several samples yielding multiple, large pyrope grains up to a maximum of 4 grains in sample 0WAH103. Several of these samples also yielded picroilmenites, chrome diopsides and eclogitic garnets (Dufresne and Kim, 2002).

Although a few indicator minerals were recovered from the Atikkamek Creek area, the best results were obtained from samples collected along tributaries to the Goose River to the south and southwest of the Lightbulb Lake permit. The highlight of the 2000 and 2001 exploration programs was the delineation of multiple samples yielding pyrope garnets accompanied by picroilmenites in two previously unsampled or poorly sampled drainages to the southwest of the Lightbulb Lake permit in Township 67, Ranges 17 and18 (Dufresne and Kim, 2002). A couple of the pyrope garnets were identified with partial orange peel texture and/or partial kelyphyte rim, often used as an indication of relative proximity to source. The bulk of the important silicate diamond indicators that are likely indicative of kimberlite are concentrated along the western portion of the property, especially in the area of the Goose River. The pyrope garnets have an apparent trend in a roughly west-northwest to east-southeast direction (Dufresne and kim, 2002); furthermore, they plot approximately along the same trend as the flanks of the Total Field magnetic high, likely a result of Proterozoic or Archean basement, on the Total Field Magnetics. Dufresne and Kim (2002) suggested that the Goose River and to the west and northwest of the Goose River require follow-up exploration including sampling. They also indicated that three other drainages require a small amount of follow-up sampling based upon the 2000 and 2001 sampling results including the headwaters of Atikkamek Creek in Township 64, Range 16, a tributary to the Wallace River in Township 67, Range 15 and a tributary to the East Prairie River in Township 68, Range 14. All three areas have yielded pyrope garnets with two of the drainages also yielding picroilmenites (Dufresne and Kim, 2002).

The airborne magnetic survey from the Lightbulb Lake property and a publicly available assessment report filed by Teuton Resources Ltd. for the Swan Hills were reviewed in detail during the 2000 and 2001 exploration programs. Several interesting magnetic anomalies in proximity to drainages yielding important diamond indicator minerals were identified in Township 65, Range 15, Township 66, Ranges 15 and 16, and Township 67, Range 15 (Dufresne and Kim, 2002).

Dufresne and Kim (2002) indicate that the 2000 and 2001 gold sampling programs yielded a few interesting geographic patterns. A total of 6 samples from the 2000 and 2001 sampling programs yielded greater 59 gold grains ($95^{th}$ percentile) up to a maximum of 171 grains. The average total gold count was 18 grains, with the highest total gold grain count of 171 grains in sample 0WAH113. The bulk of the anomalous samples are concentrated in the west-central portion of the Swan Hills property centered around the Goose River and in the vicinity of the prominent ridge along the south boundary of the Lightbulb Lake permit (Dufresne and Kim, 2002). A few anomalous samples were also identified from Atikkamek Creek near the southwest corner of the property.

Dufresne and Kim (2002) suggested that the eastern half of the property yields most of the samples with the lowest gold grain counts and the lowest calculated concentrations of gold. The eastern half of the property area represents the highest topographic portion of the property and is predominantly capped by the Swan Hills Tertiary gravels. The high gold counts and high estimated concentrations of gold for samples collected from the western half of the property are the most spectacular gold results that we have seen for Alberta with perhaps the only exception being the North Saskatchewan River from Rocky Mountain House to Edmonton. If much of the gold in the western portion of the property was derived from the erosion and reworking of the Swan Hills Tertiary gravels it would be expected to see somewhat higher gold grain counts and concentrations in the eastern half of the property in close proximity to the Swan Hills gravels. This may suggest that there is some contribution to the present day streams from local bedrock sources including placer gold in Cretaceous to Early Tertiary sandstones or vein to replacement type gold introduced into the local bedrock from hydrothermal processes. Some of the rough calculated concentrations obtained from samples along the Goose River approach the concentrations required for gold placer operations, which generally require a minimum cutoff from 200 to 500 ppb gold. However, one must keep in mind that the gold found in the Swan Hills is quite fine-grained relative to normal placer type operations, hence recovery would be an issue. The Goose River and Atikkamek Creek represent much better potential placer gold targets than the ridge area along the southwestern limit of the Lightbulb Lake property based upon the size of the drainages and the volume of gravels associated with each of these two drainages. In particular, the Goose River gravels yield as high, if not higher, estimated concentrations of gold as the samples from the south portion of the Lightbulb Lake property.

The 2000 drilling program was comprised 17 auger holes and 5 hollow-stem auger holes (Appendix 5). One or two bags of cuttings from each of the auger drillholes (samples OAH-01 to OAH-17) were sent to the SRC for standard diamond indicator analysis. The core from the hollow-stem auger drillholes (SAH-001 to SAH-005) was logged, sampled and also sent to the SRC for standard diamond indicator analysis (Dufresne and Kim, 2002). A total of 132 diamond indicator minerals were recovered from the 2000 drill samples, however, it most if not all of the indicator minerals recovered were derived from overburden or surficial sediments rather than the local Cretaceous bedrock.

Two diamond drillholes (DDH-A3-01 and DDH-SR-01) were completed within the Swan Hills property in 2001 (Dufresne and Kim, 2002). DDH-A3-01 resulted in 538 feet of core, having drilled tested the magnetic anomaly A3 identified during the January 2000 ground geophysical survey (Dufresne and Copeland, 2000). DDH-SR-01 was drilled in the southwest portion of the Lightbulb Lake permit 9397120049, on a ridge where the drainages containing multiple diamond indicator minerals originated (Dufresne and Kim, 2002). The drill core from both drillholes was logged, sampled and sent to the SRC for standard diamond indicator and gold analysis, but the results have not been reported to date.

Based upon the results of the 2000 and 2001 exploration programs, a two phase follow-up kimberlite exploration program was strongly recommended by Dufresne and Kim (2002). The Phase 1 program should consist of sampling, prospecting and the acquisition of existing and/or new airborne geophysical data. The current geophysical database covers mostly the eastern portion of the Swan Hills property; therefore, it is highly recommended that airborne geophysical data for the western portion of the property be acquired prior to any field work being conducted. Where adequate existing proprietary airborne magnetic data is not available to purchase, strong consideration should be give to conducting an airborne geophysical survey, particularly west of the Lightbulb Lake permit. Once all of the airborne geophysical survey data is acquired ground geophysical surveys should be conducted as part of the Phase 2 program in order to identify drill collars for potential kimberlite targets prior to drill testing.

## 2002 – 2003 EXPLORATION

### Surface Sampling

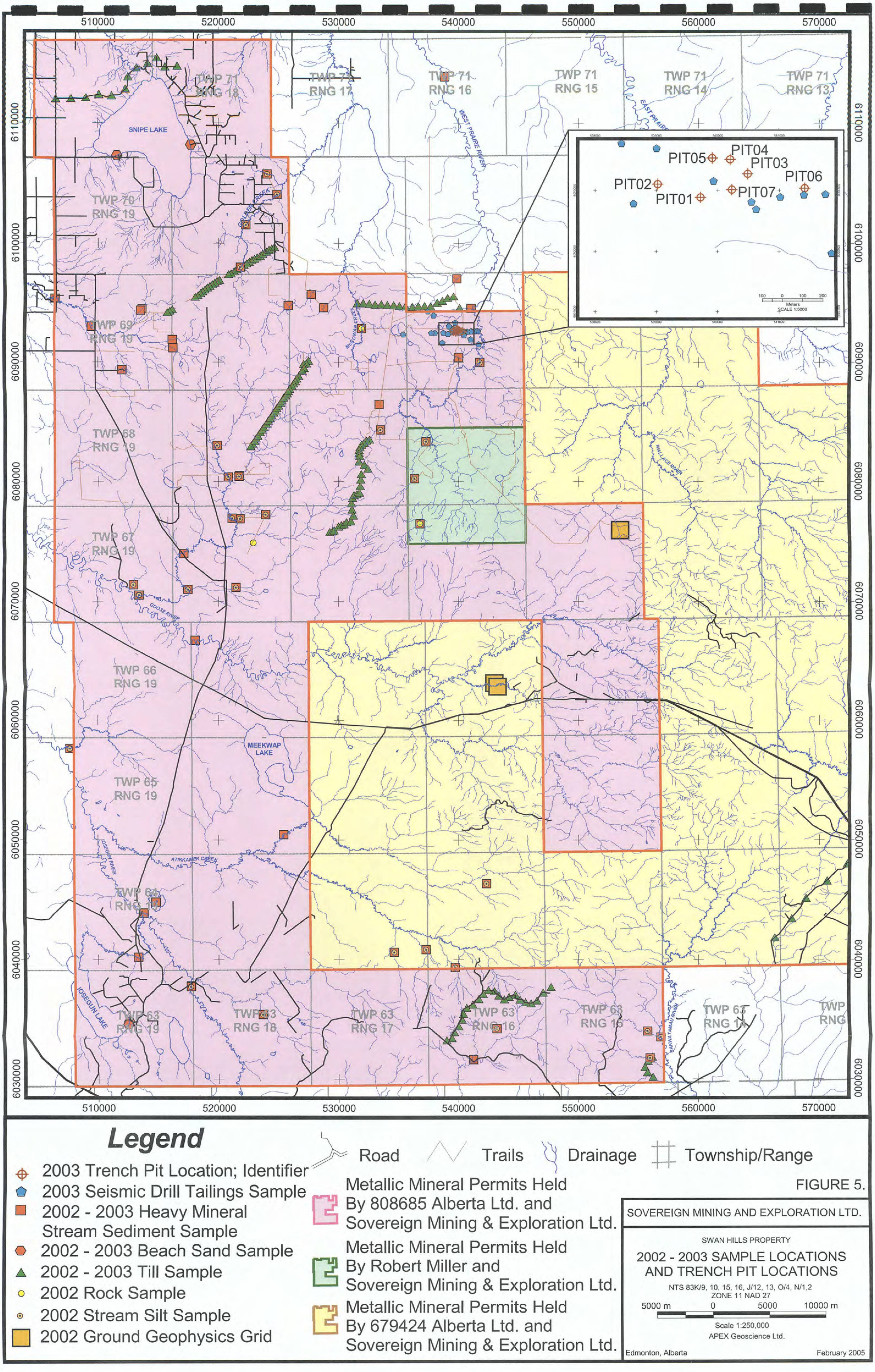
Exploration within the Swan Hills property during the fall of 2002 was conducted by a three to four man APEX crew over a period of about one month from October 23 to November 22, 2002. A one to three man prospecting and sampling crew was also provided by Sovereign over the course of the program to assist with the exploration. The sampling program was based out of the communities of Whitecourt, Valleyview and High Prairie, Alberta. Access to sample sites was by four-wheeled drive trucks and ATV's, and foot, as necessary. The fall 2003 exploration program at the Swan Hills property consisted of a 3 to 4 man APEX crew over a two month period from October 30 to December 23, 2003 and was based predominantly out of High Prairie, Alberta. Additional help in the form of one or two prospectors or samplers was also provided by Sovereign over the course of the program to assist with the exploration. Access to sample sites was by four-wheeled drive trucks, ATV's, and foot, as necessary.

The 2002 fall exploration involved regional till, stream (including pan heavy mineral concentrate [HMC], suction dredge and silt sampling), beach and rock grab sampling within the Swan Hills property. Sampling was targeted primarily along the Goose River, Golden Creek, MacGowan Creek, West Prairie River and Atikkamek Creek drainage systems, as well as in the vicinity of Snipe Lake and Iosegun Lake (Figures 5 to 8). All sample locations and brief descriptions are given in Appendix 1.

Follow-up exploration was conducted during the fall of 2003, as recommended from the outcome of the 2002 sampling program. This included semi-detailed to reconnaissance HMC and till sampling near anomalous samples sites identified from the 2002 fall exploration; in particular, lines of till samples were constructed across the ridges near the headwaters of the Goose River (the Lightbulb Lake Ridge) and Atikkamek Creek (Atikkamek Ridge). All sample locations and brief descriptions are given in Appendix 1.

### Trenching and Trench Sampling

A trenching program was conducted on the Swan Hills property between December 12 and 14, 2003. The trenching was completed by Williscroft Brothers Construction Ltd. (Williscroft) using a tracked 270 backhoe for excavating. A total of seven pits ranging from 14 to 22 feet in depth were excavated. The trenching program was initiated to obtain bedrock and basal till samples for diamond, gold and bentonite analyses. The locations for the trenches were chosen based prior work that had identified anomalously thick bentonites in outcrop. The locations of the trenches are shown on Figure 5. Pit locations and all associated sample locations and brief descriptions are given in Appendix 1.



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TWP 71 RNG 14
TWP 71 RNG 13
SNIPE LAKE
TWP 70 RNG 19
TWP 69 RNG 19
TWP 68 RNG 19
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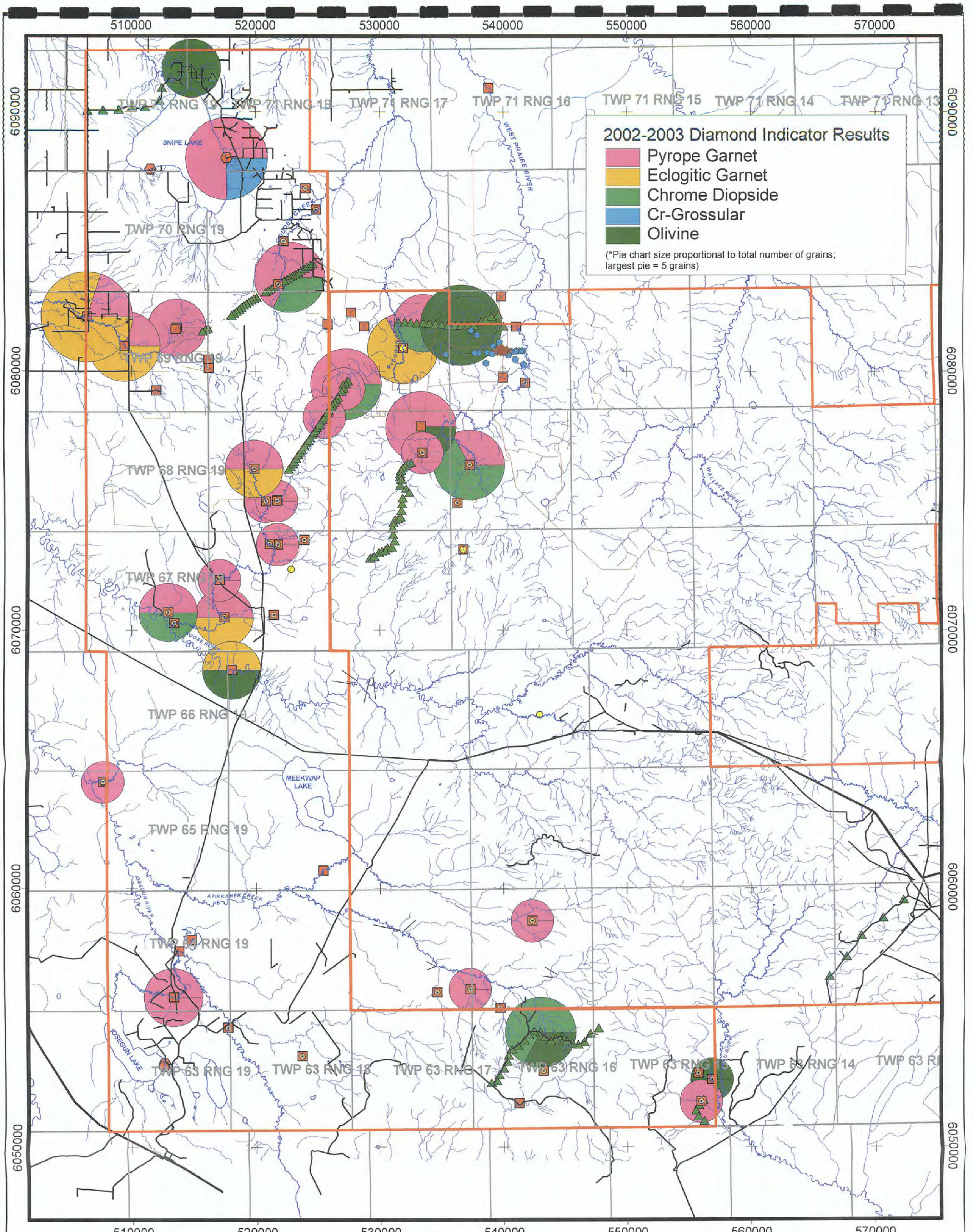
TWP 64 RNG 19
TWP 63 RNG 19
TWP 63 RNG 18
TWP 63 RNG 17
TWP 63 RNG 16
TWP 63 RNG 15
TWP 63 RNG 14
WEST PRAIRIE RIVER
EAST PRAIRIE
WALLACE RIVER
GOOSE RIVER
MEEKWAP LAKE
ATIKKAMEK CREEK
JOSEGUN RIVER
JOSEGUN LAKE
SAKWATAMAU RIVER
PIT05
PIT04
PIT03
PIT02
PIT01
PIT07
PIT06
Meters
SCALE 1:5000
Legend
2003 Trench Pit Location; Identifier
2003 Seismic Drill Tailings Sample
2002 - 2003 Heavy Mineral Stream Sediment Sample
2002 - 2003 Beach Sand Sample
2002 - 2003 Till Sample
2002 Rock Sample
2002 Stream Silt Sample
2002 Ground Geophysics Grid
Road
Trails
Drainage
Township/Range
Metallic Mineral Permits Held By 808685 Alberta Ltd. and Sovereign Mining & Exploration Ltd.
Metallic Mineral Permits Held By Robert Miller and Sovereign Mining & Exploration Ltd.
Metallic Mineral Permits Held By 679424 Alberta Ltd. and Sovereign Mining & Exploration Ltd.
FIGURE 5.
SOVEREIGN MINING AND EXPLORATION LTD.
SWAN HILLS PROPERTY
2002 - 2003 SAMPLE LOCATIONS AND TRENCH PIT LOCATIONS
NTS 83K/9, 10, 15, 16, J/12, 13, O/4, N/1,2
ZONE 11 NAD 27
5000 m 0 5000 10000 m
Scale 1:250,000
APEX Geoscience Ltd.
Edmonton, Alberta
February 2005




## Legend

- 2003 Trench Pit Location; Identifier
- 2003 Seismic Drill Tailings Sample (Compara Consulting Ltd.)
- 2002 - 2003 Heavy Mineral Stream Sediment Sample
- 2002 - 2003 Beach Sand Sample
- 2002 - 2003 Till Sample
- 2002 Rock Sample
- 2002 Stream Silt Sample
- Township/Range
- Road
- Trails
- Metallic Mineral Permits Held By Sovereign Mining
- Drainage

FIGURE 6.

SOVEREIGN MINING AND EXPLORATION LTD.

SWAN HILLS PROPERTY

2002 - 2003 SILICATE DIAMOND INDICATOR RESULTS

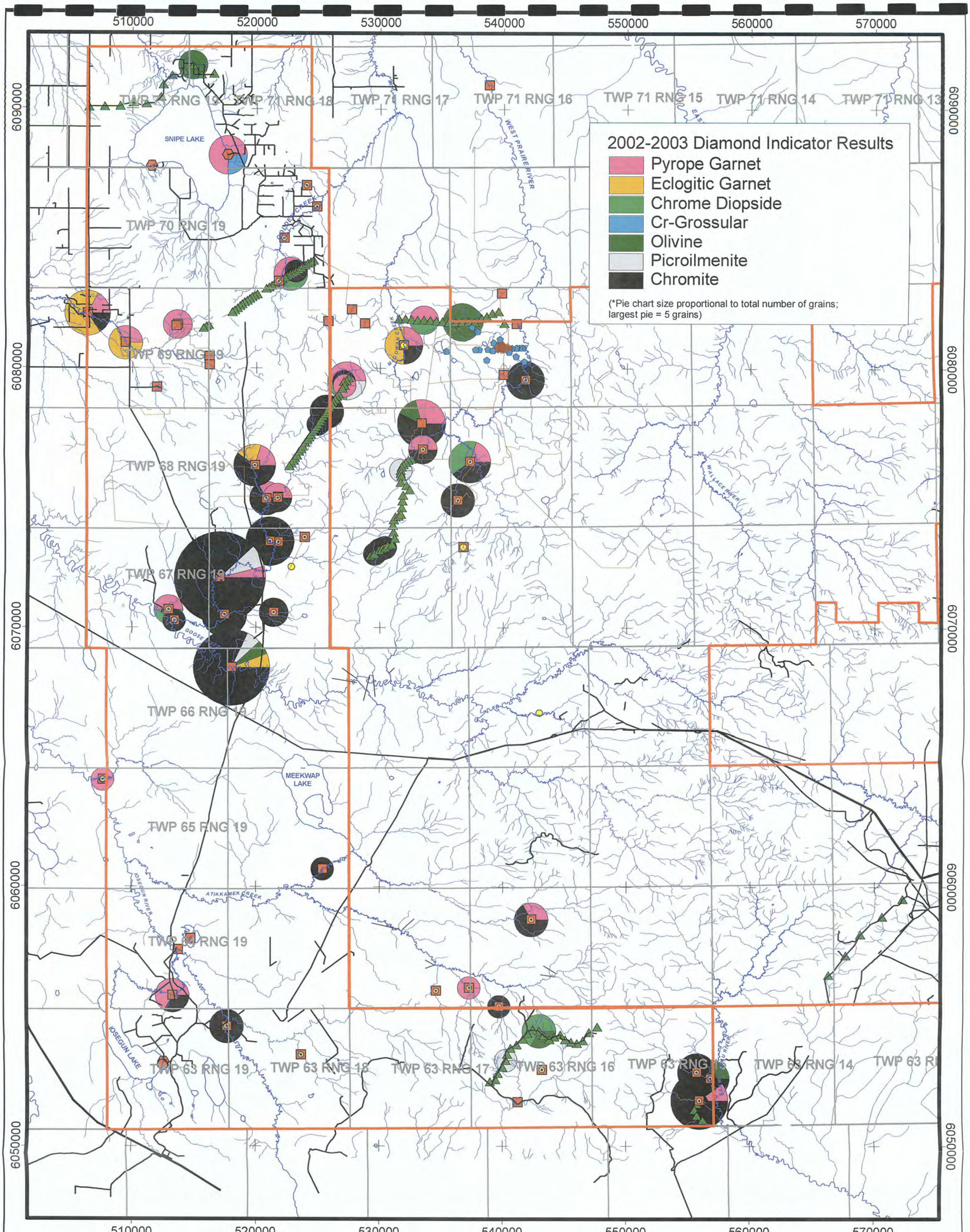
NTS 83K/9, 10, 15, 16, J/12, 13, O/4, N/1,2
ZONE 11 NAD 27

5000 m 0 5000 10000 m

Scale 1:250,000

APEX Geoscience Ltd.

Edmonton, Alberta February 2005




## Legend

- 2003 Trench Pit Location; Identifier
- 2003 Seismic Drill Tailings Sample (Compara Consulting Ltd.)
- 2002 - 2003 Heavy Mineral Stream Sediment Sample
- 2002 - 2003 Beach Sand Sample
- 2002 - 2003 Till Sample
- 2002 Rock Sample
- 2002 Stream Silt Sample
- Township/Range
- Road
- Trails
- Metallic Mineral Permits Held By Sovereign Mining
- Drainage

FIGURE 7.

SOVEREIGN MINING AND EXPLORATION LTD.

SWAN HILLS PROPERTY

**2002 - 2003 TOTAL DIAMOND INDICATOR RESULTS**

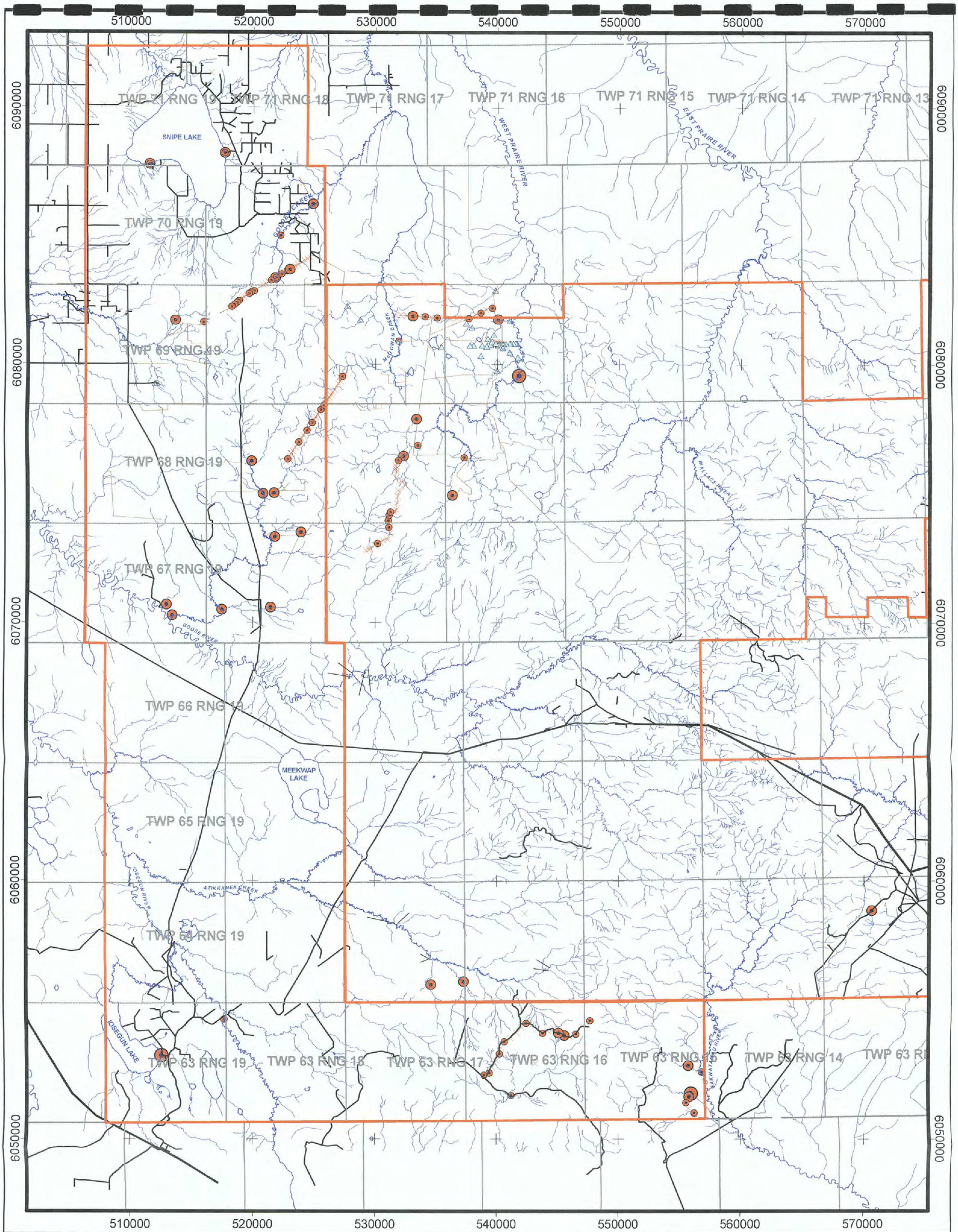
NTS 83K/9, 10, 15, 16, J/12, 13, O/4, N/1,2
ZONE 11 NAD 27

5000 m 0 5000 10000 m

Scale 1:250,000

APEX Geoscience Ltd.

Edmonton, Alberta February 2005




# Legend

**2002-2003 Picked Gold Grains**

- 0 - 1
- 2 - 4
- 5 - 19
- 20 - 49
- 50 - 399
- 400 - 1250
- Awaiting Result

Sample with largest numb er of grains = 29 Grains of Gold

- Township/Range
- Road
- Trails
- Metallic Mineral Permits Held By Sovereign Mining
- Drainage

FIGURE 8.

SOVEREIGN MINING AND EXPLORATION LTD.

SWAN HILLS PROPERTY

**2002 - 2003 PICKED GOLD GRAIN RESULTS**

NTS 83K/9, 10, 15, 16, J/12, 13, O/4, N/1,2
ZONE 11 NAD 27

5000 m 0 5000 10000 m

Scale 1:250,000
APEX Geoscience Ltd.

Edmonton, Alberta

February 2005

### Ground Geophysical Surveys

During the fall 2002 exploration program, APEX constructed two ground geophysical grids in order to conduct ground magnetometer surveys over three magnetic targets identified by Dufresne and Kim (2002). The locations of the grids are shown on Figure 5. The magnetic data, including contoured colour images, are provided in Appendix 2.

## 2002 – 2003 EXPLORATION RESULTS AND DISCUSSION

### Surface Sampling Results

A total of 326 samples were collected during the 2002 and 2003 exploration programs (89 and 237 samples, respectively), which consisted of HMC, surface rock grab, trench rock grab, stream silt and till samples (Appendix 1). All HMC and till samples were sent to the SRC for standard diamond indicator mineral (DIM) analyses (Appendix 3). The picked diamond indicator grains were then sent to Mr. Tom Bonli of the University of Saskatchewan, Saskatoon, Saskatchewan for microprobe analyses, which are included in Appendix 3. The confirmed oxide and silicate indicator results for all the samples, to date, are presented in Appendix 3 and on Figures 6 and 7. Stream silt samples collected during 2002 were sent to the SRC for standard sieve and ICP trace geochemical analysis. The results are included in Appendix 4. All trench rock grab samples were sent to the SRC and analyzed by whole rock ICP analysis, an analytical techniques designed to look at the geochemistry of the bentonites and bentonitic mudstones. All the stream and beach HMC samples as well as the till samples were tabled and picked for gold grains. The results are presented in Appendix 5 and are displayed on Figure 8.

Diamond and gold exploration during the falls of 2002 and 2003 were concentrated on the newly staked permits in the Sakwatamau River to Iosegun Lake area and the Meekwap Lake to Snipe Lake area. A total of 40 regional HMC creek samples, 7 HMC suction dredge samples, 4 HMC beach samples, 31 stream silt samples and 7 rock samples were collected during the fall 2002 program (Appendix 1). During 2003, a significant amount of follow-up till sampling was conducted in the Lightbulb Lake Ridge area in order to look at the potential for concentrations of diamond indicator minerals and gold grains contained within deposits of till along the ridge. A total of 163 till samples, 30 composite drill cuttings samples, 13 HMC stream samples and 31 rock grab samples from excavated trenches were collected (Appendix 1).

#### *Diamond Exploration*

The 2002 diamond indicator sampling confirmed and extended a high quality diamond indicator anomaly from the anomalous ridge area south of Lightbulb Lake and north of the Goose River (known from previously sampling) to as far northwest as Snipe Lake. In addition, the 2002 sampling combined with the results of previous work by

Ashton Mining of Canada Inc. (Ashton) has resulted in the identification of other lower priority anomalous areas including the Meekwap Lake area, and an area from Iosegun Lake east to the headwaters of Atikkamek Creek, bounded by the Sakwatamau River. Work by Ashton has also resulted in the identification of a number of other potentially anomalous areas yielding possible olivine including north of the Swan Hills permits in the vicinity of the West and East Prairie rivers, and east-southeast of the Swan Hills permits in the vicinity of Highway 32 and the Freeman River.

The 2002 creek sampling program yielded a number of high quality diamond indicator anomalies in creeks north of the Goose River draining the Lightbulb Lake Ridge that trends northwest from south of Lightbulb Lake all the way to Snipe Lake a distance of more than 50 km. This area is considered a high priority target for follow-up kimberlite exploration based upon the results of the 2002 and prior sampling programs. The 2002 program yielded a total of 14 creek sites on the new permits and 4 sites on the old permits draining the Lightbulb Lake Ridge that yielded at least one silicate indicator mineral, and in a number of cases multiple grains, indicative of kimberlite.

The new 2002 sampling in the Lightbulb Lake Ridge area also yielded a number of significant milestone geochemical results in this high priority target area. A total of 4 borderline G10 pyrope garnets, with two of the garnets yielding 11 and 12 wt% $Cr_2O_3$, were from samples collected during the 2002 program. The G10 pyrope garnets represent a very distinct and different population of garnets then the G9 pyrope garnets that have been recovered in the past. The high Cr, low Ti G10 pyrope garnets can be diagnostic of potentially diamond bearing high-pressure peridotite mantle that was sampled and brought to surface by kimberlites in the region. Two of the G10 pyrope garnets, including one of the high Cr grains, were obtained from beach sand collected from the east shore of Snipe Lake along with a G9 pyrope garnet. The other high Cr G10 pyrope garnet was obtained from a creek draining into the Goose River, along with a high Cr chrome diopside in Township 67, Range 19. The high Cr chrome diopside is also most likely derived from peridotitic mantle via kimberlite.

Samples collected during 2002 from the Lightbulb Lake Ridge area also yielded a significant population of true low Fe eclogitic garnets that were likely derived from eclogitic mantle brought to surface in kimberlites. A total of 11 eclogitic garnets were recovered from 6 separate samples with a range in Fe ranging from 10.57 wt% up to 20.08 wt% total Fe as $Fe_2O_3$. At least one of the eclogitic garnets also yields elevated Na with 0.06 wt% $Na_2O$. Concentrations of $Na_2O$ greater than 0.07 wt% in eclogitic garnets are often associated with high pressure eclogitic mantle derived from the diamond stability field. All of the samples containing eclogitic garnets were collected from drainages draining the Lightbulb Lake Ridge. In addition, all of these samples also yielded at least one or more other kimberlitic minerals such as pyrope garnet or picroilmenite. A few eclogitic garnets had been recovered during prior sampling programs but only one grain of the quality exhibited by those recovered during the 2002 program was recovered during prior sampling programs.

The 2002 sampling program also yielded two sample sites with one and two kimberlitic picroilmenites, respectively, draining the southwest flank of the Lightbulb Lake Ridge from or near the Goose River. The sample that yielded the two kimberlitic picroilmenites also yielded a number of chromites, one of which contains greater than 60 wt% $Cr_2O_3$, and a second that contains 59.75 wt% $Cr_2O_3$, therefore both potentially derived from the diamond stability field for chromite-bearing peridotite mantle. Almost all of the creek sites draining the Lightbulb Lake Ridge in the vicinity of the Lightbulb Lake permit and the Goose River yield a number of chromites. A number of high Ti and high Cr kimberlitic chromites were recovered from the Lightbulb Lake Ridge area during the 2002 sampling program. Interestingly, samples collected from drainages further to the northwest in the vicinity of Snipe Lake yielded few if any chromites, however, a number of the samples yielded anomalous silicate indicator minerals. The reason for this is unclear, however it could be related to a change in the tertiary sedimentary environment responsible for the chromites and it may help to confirm that the bulk of the chromites being recovered in the Swan Hills are not likely derived from kimberlite intrusions and/or that they represent several cycles of erosion and are not related to the silicate indicator mineral assemblage that is being recovered.

Based upon the results of the 2002 sampling program the Lightbulb Lake Ridge area should be considered a high priority target area for the presence of kimberlites and follow-up exploration. The 2002 sampling program, with the recovery of a few borderline but high Cr G10 pyrope garnets, a few high Cr chromites and a number of excellent chemistry eclogitic garnets, also demonstrates that the Lightbulb Lake Ridge area may have at least moderate potential for diamondiferous kimberlites. The Lightbulb Lake Ridge area requires follow-up sampling, airborne and ground geophysical surveys followed by drilling. The bulk of the Lightbulb Lake Ridge area has not been covered with a detailed airborne geophysical survey. Strong consideration should be given to flying a helicopter magnetic-electromagnetic survey in order to delineate possible kimberlite targets in the area.

In order to test the possibility that a large number of the highly favourable diamond indicator minerals recovered to date from the Lightbulb Lake area are being derived from a blanket of till overlying the ridge, a till sampling program was conducted during 2003. Al total of 131 till samples were collected in five till lines across the Lightbulb Lake Ridge and northwest of Snipe Lake to test for indicator minerals in the till (Figures 5 to 7). A total of 18 till samples yielded at least 1 picked diamond indicator mineral up to a maximum of 4 DIMs, however, only 8 samples actually yielded silicate DIMs up to a maximum of 4 grains (Appendix 3 and Figures 6 and 7). Although microprobe results have not been received for the 2003 till samples to date, it is evident that the sparse number of indicator minerals recovered from till samples in the Lightbulb Lake Ridge area may potentially indicate that the large numbers of indicator minerals being recovered from drainages surrounding the ridge are locally derived from buried kimberlites.

One sample collected from the Meekwap Lake area during the 2002 sampling program yielded a pyrope garnet. This sample adds to a number of anomalous samples collected from along the Goose River that have yielded indicator minerals that could be shedding from the Meekwap Lake area. A compilation of prior sampling data from Ashton also indicates the presence of olivine in a couple of till sample sites in the vicinity of the Meekwap Lake area. However, it should be noted that the Ashton diamond indicator data represents picked and not microprobe confirmed data. The Meekwap Lake area is considered a lower priority target area that does require follow-up sampling as it has had much less sampling then the area north of he Goose River due to difficulties with access and low somewhat swampy land. The Meekwap Lake area may require till sampling to advance the area any further. No work was conducted in the Meekwap Lake area during the 2003 program. Strong consideration should be give to purchasing the 400 m airborne magnetic data for the area prior to conducting any airborne geophysical surveys.

A third area within the Swan Hills permits has yielded a number of indicator minerals during the 2002 sampling program and requires follow-up exploration. The anomalous area is located near the south end of the property between Iosegun Lake and the Sakwatamau River. The area can be divided into two distinct geographic domains with the swampy lowlands in the vicinity of Iosegun Lake and the better drained uplands forming a ridge (Atikkamek Ridge) that divides the headwaters of Atikkamek Creek from the Sakwatamau River. The anomalous samples in the Iosegun Lake area are comprised of one creek sample from the Iosegun River that yielded two pyrope garnets and a second sample site in a tributary to the Iosegun River that yielded three chromites, one of which contains almost 3 wt% $TiO_2$ and 44.26 wt% $Cr_2O_3$, and is most likely derived from a kimberlite. In addition, prior till sampling by Ashton to the southeast of the area indicates the possible presence of olivines, picroilmenites, eclogitic garnets and kimberlitic chromites in till that is potentially down ice of the area. For the most part, the till is thought to be relatively thin in the region. Hence, the Ashton results could indicate a potential kimberlite source in the vicinity of the Iosegun Lake and Iosegun River area. The area is considered low to moderate priority but does warrant a small amount of follow-up exploration for kimberlites.

Sampling of Atikkamek Creek, the Sakwatamau River and their tributaries indicate that the northeast-southwest trending ridge that divides the two drainages is a strong candidate for the presence of possible kimberlites. A number of samples collected from drainages along the ridge have yielded pyrope garnets, olivine, picroilmenites and kimberlitic chromites. One sample, 02CPH002 from the Sakwatamau River, yielded three chromites, one of which is cored by a grain of forsteritic (high Mg) olivine and could be considered a kimberlite fragment. The potential for the presence of kimberlites is considered moderate to high for the Atikkamek Ridge area, however, the diamond potential is considered lower than the Lightbulb Lake Ridge area due to a lack of definitive indicator grains that indicate the presence of mantle that could have been derived from the diamond stability field. It should be noted however, that the area has seen far less sampling than the Lightbulb Lake Ridge area and therefore warrants further exploration. Follow-up work during

2003 resulted in the collection of 27 till samples in the Attikamek Creek Ridge area of which only two of the samples yielded picked DIMs (Appendix 3 and Figures 6 and 7). The distinct lack of significant numbers of indicator minerals in the till samples may also point to a local source such as buried kimberlite for the DIMs that have been recovered to date in the Attikamek drainages.

***Gold Exploration***

Standard heavy mineral creek sampling during the 2002 exploration program has confirmed that the highest gold concentrations, including number of grains and calculated gold concentrations, are centered on the southeast portion of the Lightbulb Lake Ridge and the Goose River immediately south of the Lightbulb Lake Ridge. The larges number of gold grains recovered from the 2002 sampling program was 29 in a sample collected from a tributary to the Sakwatamau River at the south border of the property, and 21 grains in a sample collected from the headwaters of the West Prairie River. The largest calculated concentration of gold was 54 ppb for a sample collected from a south draining tributary to the Goose River along the south side of the Lightbulb Lake Ridge. A number of samples collected from the Lightbulb Lake Ridge area yield calculated gold concentrations of 20 up o 54 ppb. In terms of potential economic placer concentrations, the overall picture is that the gold concentration and the potential for any kind of volume are somewhat restricted in the uplands area in the vicinity of the Lightbulb Lake Ridge. Based upon the sampling conducted to date the Goose River and a couple of its south draining tributaries represent the only target drainages that could have the combined character of gold grade and volume of mineable gravel. To determine the potential of the Goose River and its tributaries further sampling, including bulk sampling, will be required to determine the placer gold potential.

Although gold has been found in almost every sample across the Swan Hills property, the eastern half of the property yields most of the samples with the lowest gold grain counts and the lowest calculated concentrations of gold. The eastern half of the property area represents the highest topographic portion of the property and is predominantly capped by the Swan Hills Tertiary gravels. The high gold counts and high estimated concentrations of gold for samples collected from the western half of the property are the most spectacular gold results that I have seen for Alberta with perhaps the only exception being the North Saskatchewan River from Rocky Mountain House to Edmonton. If much of the gold in the western portion of the property was derived from the erosion and reworking of the Swan Hills Tertiary gravels it would be expected to see somewhat higher gold grain counts and concentrations in the eastern half of the property in close proximity to the Swan Hills gravels. This may suggest that there is some contribution to the present day streams from local bedrock sources including placer gold in Cretaceous to Early Tertiary sandstones or vein to replacement type gold introduced into the local bedrock from hydrothermal processes. Some of the rough calculated concentrations obtained from samples along the Goose River approach the concentrations required for gold placer operations, which generally require a minimum cutoff from 200 to 500 ppb gold. However, one must keep in mind that the gold found in the Swan Hills is quite fine-grained relative to normal placer type operations, hence recovery would be an issue. The Goose River and associated tributaries represent the best potential placer gold targets draining the Lightbulb Lake Ridge area based upon the size of the drainages and the volume of gravels associated with these drainages

The Lightbulb Lake Ridge area represents one of the largest and strongest gold in drainage anomalies in Alberta. Based upon the amount of gold found in a number of immature upland drainages it is highly likely that some of the gold sourcing from the Lightbulb Lake Ridge drainages could be related to a bedrock source. In order to aid in determining whether any of the Lightbulb Lake Ridge results could indicate a bedrock source for gold, a suction dredge sampling protocol was employed based upon the recommendations of Mr. Alex Burton. A total of seven samples were collected using a pump with attached suction hose connected to a small sluice box and running about a 0.5 to 1 $m^3$ sample of gravel through the sluice until the riffles and carpet were filled. The carpet concentrates were then screened at 140 mesh (0.1mm) in order to create a +0.1mm and –0.1mm concentrate, which were both then fire assayed for gold. The theory is that placer gold traps will yield high concentrations of gold in both the +0.1mm and –0.1mm size fractions. Gold lodes will tend to yield high concentrations of gold in the fine fraction and little or no gold in the coarse size fraction. The critical data is the relative distribution of gold in the two fractions not the absolute concentration. The actual grade of the drainage sites is not critical and has not been back calculated as neither weight nor volume were recorded for each of the sluice sample sites. Six samples were collected from drainages around the Lightbulb Lake Ridge. Three of the samples, yielded high concentrations of gold in the fine size fraction and low concentrations of gold in the coarse size fraction, including the original anomalous sample site at the headwaters of the West Prairie River, suggesting that the potential is perhaps high that there are multiple lode gold sources in the Lightbulb Lake Ridge area. Further sampling and exploration are required to evaluate this possibility.

## Geophysical Survey Results

Three airborne geophysical anomalies potentially representative of kimberlite targets were covered with two magnetic surveys during the fall of 2002 (Appendix 2 and Figure 5). High intensity spike like magnetic anomalies coincident with burnt coal rich horizons were observed at target SB5 (Anomaly 31). Little or no magnetic anomaly was detected in the survey over anomaly CS6-7 (Appendix 2).

## 2002 – 2003 EXPLORATION EXPENDITURES

Exploration expenditures for the 2002 and 2003 exploration programs for the Swan Hills property were $319,601.81. Appendix 6 presents a breakdown of these expenses as received from Sovereign.

## RECOMMENDATIONS

The recent and past results of diamond exploration in the Swan Hills has resulted in the identification of a least one high priority target area for future diamond and kimberlite exploration. Follow-up sampling, prospecting, an airborne geophysical survey followed by ground geophysical surveying is considered high priority for future exploration of the Swan Hills property. The current existing airborne geophysical data covers mostly the eastern portion of the Swan Hills property; therefore, it is highly recommended that airborne geophysical data for the western portion, in particular for the Lightbulb Lake Ridge area be acquired. Based upon the fact that overburden is likely thin over most of the Swan Hills property, and the recent successful discovery of kimberlites by Ashton employing magnetic and electromagnetic surveys, strong consideration should be given to flying the entire Lightbulb Lake Ridge with a helicopter magnetic and electromagnetic survey in order to identify prospective kimberlite targets for drilling. Follow-up sampling and prospecting should be focused on the Lightbulb Lake Ridge area and the Atikkamek Ridge area and the drainages surrounding these areas, where most of the encouraging results have come from to date.

Strong consideration should be given to conducting a 5,000 line-km helicopter magnetic and electromagnetic survey over a portion of the Lightbulb Lake Ridge area. The survey cost including fuel and subcontract costs will likely be on the order of $600,000 at an all up cost of $120 per line-km. Alternatively, a fixed wing Geotem survey that would also provide magnetic and electromagnetic data for kimberlite exploration could be flown at about an all up cost of about $60 per line-km for a total cost of about $300,000. It is strongly recommended that existing available magnetic data be acquired for the region outside of the existing Swan Hills magnetic survey. This data will help to prioritize which portion of the Lightbulb Lake Ridge area should be flown using magnetic and electromagnetic methods. Consideration should also be given to conducting a follow-up detailed creek and till sampling over the Lightbulb Lake Ridge and further reconnaissance sampling for diamond indicator minerals in the Iosegun Lake and Atikkamek Ridge areas. The program should be conducted during late September to October in order to take advantage of partial freeze up and the resulting better access. The estimated cost to conduct such a program would be on the order of about $200,000 including sample processing and diamond indicator analysis.

PERMIT TO PRACTICE
APEX Geoscience Ltd.
Signature
Date December 13, 2006
PERMIT NUMBER: P-5824
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

**APEX Geoscience Ltd.**

Michael B. Dufresne, M.Sc., P.Geol.

Edmonton, Alberta
March, 2005

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## CERTIFICATION

I, M.B. DUFRESNE OF 267 BURTON ROAD, EDMONTON, ALBERTA, CERTIFY AND DECLARE THAT I AM A GRADUATE OF THE UNIVERSITY OF NORTH CAROLINA AT WILMINGTON WITH A B.SC. DEGREE IN GEOLOGY (1983) AND A GRADUATE OF THE UNIVERSITY OF ALBERTA WITH A M.SC. DEGREE IN ECONOMIC GEOLOGY (1987). I AM REGISTERED AS A PROFESSIONAL GEOLOGIST WITH THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS AND GEOPHYSICISTS OF ALBERTA.

MY EXPERIENCE INCLUDES SERVICE AS AN EXPLORATION GEOLOGIST WITH THE DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT, YUKON, FROM 1983 TO 1985. FROM 1986 TO 1993, I HAVE CONDUCTED AND DIRECTED PROPERTY EXAMINATIONS AND EXPLORATION PROGRAMS ON BEHALF OF COMPANIES AS A GEOLOGIST IN THE EMPLOY OF R.A. OLSON CONSULTING LTD. AND ITS PREDECESSOR COMPANY TRIGG, WOOLLETT, OLSON CONSULTING LTD. OF EDMONTON, ALBERTA. SINCE JANUARY 1994, I HAVE CONDUCTED AND DIRECTED PROPERTY EXAMINATIONS, PROPERTY EVALUATIONS AND EXPLORATION PROGRAMS ON BEHALF OF COMPANIES AS A PRINCIPAL IN APEX GEOSCIENCE LTD.

I CURRENTLY DO NOT HAVE AN INTEREST IN SOVEREIGN MINING AND EXPLORATION LTD. APEX GEOSCIENCE LTD. HAS NO INTEREST, DIRECT OR INDIRECT, IN THE PROPERTIES, OR SECURITIES OF SOVEREIGN MINING AND EXPLORATION LTD., NOR DOES IT EXPECT TO RECEIVE SUCH INTEREST.

THIS REPORT ENTITLED "**ASSESSMENT REPORT SWAN HILLS PROPERTY, NORTH-CENTRAL ALBERTA MINERAL PERMITS 9302040003 TO 9302040023**" IS BASED UPON THE STUDY OF PUBLISHED AND UNPUBLISHED DATA AND FIELD EXAMINATIONS CONDUCTED THEREON.

I HEREBY GRANT SOVEREIGN MINING AND EXPLORATION LTD. OF DRAYTON VALLEY, ALBERTA, PERMISSION TO USE THIS REPORT AS AN ASSESSMENT REPORT FOR THE SWAN HILLS PROPERTY AS WELL FOR PROSPECTUS OR AIF FILINGS FOR THE PURPOSE OF CORPORATE FINANCING.

PROFESSIONAL GEOLOGIST MICHAEL B. DUFRESNE ALBERTA

M.B. DUFRESNE, M.SC., P.GEOL.

MARCH, 2005
EDMONTON, ALBERTA

# APPENDIX 1
# 2002-2003 SAMPLE AND TRENCH/PIT LOCATIONS

## 2002 - 2003 Sample List - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Date | Sampler | UTM_Easting N27 | UTM_Northing N27 | Zone | Analysis Type | Result Received |
|---|---|---|---|---|---|---|---|---|
| 2002 Sample List | | | | | | | | |
| 02BWP100 | Rock Grab | 1-Nov | BW | 507683 | 6057601 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02BWP101 | Rock Grab | 2-Nov | BW/WC | 522871 | 6074860 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02BWP102 | Rock Grab | 4-Nov | BW/WC | 513387 | 6070512 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02CPP100 | Rock Grab | 22-Nov | BW/CP | 453231 | 6063070 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02CPP101 | Rock Grab | 22-Nov | BW/CP | 542959 | 6063077 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02CDP107 | Rock Grab | | | 531900 | 6092775 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02ACDGP108 | Rock Grab | | | 536751 | 6076463 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | No |
| 02BWS001 | Stream Silt | 25-Oct | BW | 543192 | 6034194 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS002 | Stream Silt | 1-Nov | BW | 507683 | 6057601 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS003 | Stream Silt | 2-Nov | BW/WC | 523913 | 6077223 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS004 | Stream Silt | 2-Nov | BW/WC | 521778 | 6076871 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS005 | Stream Silt | 2-Nov | BW/WC | 521125 | 6076909 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS006 | Stream Silt | 3-Nov | BW/WC | 520804 | 6080359 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS007 | Stream Silt | 3-Nov | BW/WC | 521697 | 6080407 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS008 | Stream Silt | 3-Nov | BW/WC | 519860 | 6083018 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS009 | Stream Silt | 4-Nov | BW/WC | 521447 | 6071161 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS010 | Stream Silt | 4-Nov | BW/WC | 517447 | 6070996 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS011 | Stream Silt | 4-Nov | BW/WC | 512938 | 6071389 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS012 | Stream Silt | 4-Nov | BW/WC | 513387 | 6070512 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS013 | Stream Silt | 6-Nov | BW/WC | 524032 | 6105754 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS014 | Stream Silt | 6-Nov | BW/WC | 524851 | 6104069 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS015 | Stream Silt | 6-Nov | BW/WC | 521781 | 6097986 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS016 | Stream Silt | 6-Nov | BW/WC | 522229 | 6101511 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS017 | Stream Silt | 8-Nov | BW/WC | 537266 | 6083335 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS018 | Stream Silt | 8-Nov | BW/WC | 536301 | 6080230 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS019 | Stream Silt | 8-Nov | BW/WC | 533462 | 6084326 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS020 | Stream Silt | 19-Nov | BW/CP | 541766 | 6089963 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWS021 | Stream Silt | 19-Nov | BW/CP | 531896 | 6092778 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02CPS001 | Stream Silt | 23-Oct | CP | 555745 | 6034004 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02CPS002 | Stream Silt | 23-Oct | CP | 556848 | 6033502 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02CPS003 | Stream Silt | 24-Oct | CP | 537272 | 6040839 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02CPS004 | Stream Silt | 24-Oct | CP | 534606 | 6040594 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02HKS001 | Stream Silt | 24-Oct | CP | 555977 | 6031735 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02HKS002 | Stream Silt | 24-Oct | HK | 539711 | 6039312 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02HKS003 | Stream Silt | 24-Oct | HK | 542325 | 6046363 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02WCS001 | Stream Silt | 1-Nov | MD/WC | 517674 | 6037705 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02WCS002 | Stream Silt | 1-Nov | MD/WC | 517674 | 6037705 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02WCS003 | Stream Silt | 1-Nov | MD/WC | 523646 | 6035396 | 11 | Sieve at -80 mesh, Au & multielement ICP by aqua regia | Yes |
| 02BWH001 | Pan Concentrate (HMC) | 25-Oct | BW | 543192 | 6034194 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH002 | Pan Concentrate (HMC) | 25-Oct | BW | 541234 | 6031587 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH005 | Pan Concentrate (HMC) | 1-Nov | BW | 507683 | 6057601 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH006 | Pan Concentrate (HMC) | 1-Nov | BW | 525393 | 6050432 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH007 | Pan Concentrate (HMC) | 2-Nov | BW/WC | 523913 | 6077223 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH008 | Pan Concentrate (HMC) | 2-Nov | BW/WC | 521778 | 6076871 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH009 | Pan Concentrate (HMC) | 2-Nov | BW/WC | 521125 | 6076909 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH010 | Pan Concentrate (HMC) | 3-Nov | BW/WC | 520804 | 6080359 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH011 | Pan Concentrate (HMC) | 3-Nov | BW/WC | 521736 | 6080478 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH012 | Pan Concentrate (HMC) | 3-Nov | BW/WC | 521697 | 6080407 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH013 | Pan Concentrate (HMC) | 3-Nov | BW/WC | 519860 | 6083018 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH014 | Pan Concentrate (HMC) | 4-Nov | BW/WC | 521447 | 6071161 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH015 | Pan Concentrate (HMC) | 4-Nov | BW/WC | 517447 | 6070996 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH016 | Pan Concentrate (HMC) | 4-Nov | BW/WC | 512938 | 6071389 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH017 | Pan Concentrate (HMC) | 4-Nov | BW/WC | 513387 | 6070512 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH018 | Pan Concentrate (HMC) | 6-Nov | BW/WC | 524032 | 6105754 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH019 | Pan Concentrate (HMC) | 6-Nov | BW/WC | 524851 | 6104069 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH020 | Pan Concentrate (HMC) | 6-Nov | BW/WC | 521781 | 6097986 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |

## 2002 - 2003 Sample List - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Date | Sampler | UTM_Easting N27 | UTM_Northing N27 | Zone | Analysis Type | Result Received |
|---|---|---|---|---|---|---|---|---|
| 02BWH021 | Pan Concentrate (HMC) | 6-Nov | BW/WC | 522229 | 6101511 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH022 | Pan Concentrate (HMC) | 8-Nov | BW/WC | 537266 | 6083335 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH023 | Pan Concentrate (HMC) | 8-Nov | BW/WC | 536301 | 6080230 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH024 | Pan Concentrate (HMC) | 8-Nov | BW/WC | 533345 | 6086447 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH025 | Pan Concentrate (HMC) | 8-Nov | BW/WC | 533462 | 6084326 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH026 | Pan Concentrate (HMC) | 19-Nov | BW/CP | 541766 | 6089963 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH027 | Pan Concentrate (HMC) | 19-Nov | BW/CP | 531896 | 6092778 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02CPH001 | Pan Concentrate (HMC) | 23-Oct | CP/HK | 555745 | 6034004 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02CPH002 | Pan Concentrate (HMC) | 23-Oct | CP/HK | 556848 | 6033502 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02CPH003 | Pan Concentrate (HMC) | 24-Oct | CP | 537272 | 6040839 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02CPH004 | Pan Concentrate (HMC) | 24-Oct | CP | 534606 | 6040594 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02HKH001 | Pan Concentrate (HMC) | 24-Oct | BW/HK | 555977 | 6031735 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02HKH002 | Pan Concentrate (HMC) | 24-Oct | HK | 539711 | 6039312 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02HKH003 | Pan Concentrate (HMC) | 24-Oct | HK | 542325 | 6046363 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02MDH102 | Pan Concentrate (HMC) | 2-Nov | MD | 513619 | 6094434 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02MDH103 | Pan Concentrate (HMC) | 2-Nov | MD | 513505 | 6094322 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02WCH001 | Pan Concentrate (HMC) | 1-Nov | MD/WC | 514781 | 6044811 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02WCH002 | Pan Concentrate (HMC) | 1-Nov | MD/WC | 513776 | 6043896 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02WCH003 | Pan Concentrate (HMC) | 1-Nov | MD/WC | 513315 | 6040184 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02WCH004 | Pan Concentrate (HMC) | 1-Nov | MD/WC | 517682 | 6037764 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02WCH005 | Pan Concentrate (HMC) | 1-Nov | MD/WC | 517674 | 6037705 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02WCH006 | Pan Concentrate (HMC) | 1-Nov | MD/WC | 523646 | 6035396 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02MDH104 | Suction Dredge | 2-Nov | MD | 518048 | 6066707 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02MDH105 | Suction Dredge | 3-Nov | MD | 517087 | 6073974 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02MDH106 | Suction Dredge | 3-Nov | MD | 509423 | 6092937 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02MDH107 | Suction Dredge | 3-Nov | MD | 506378 | 6095322 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02CDH103 | Suction Dredge | | CH | 531900 | 6092775 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02ACDGH108 | Suction Dredge | | CH | 536751 | 6076463 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02CJOH002 | Suction Dredge | | CH | 580455 | 6047510 | 11 | Sieve at 140 mesh and Fire Assay fro Au -140 and +140 fractions | Yes |
| 02BWH003 | Beach | 31-Oct | BW | 512565 | 6034805 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02BWH004 | Beach | 31-Oct | BW | 512510 | 6034574 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02MDH100 | Beach | 2-Nov | MD | 511549 | 6107259 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 02MDH101 | Beach | 2-Nov | MD | 517684 | 6108161 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| **2003 Sample List** | | | | | | | | |
| 03NVT001 | Till | 1-Nov | AM/NV/BW | 532557 | 6083523 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT002 | Till | 1-Nov | AM/NV/BW | 532292 | 6083436 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT003 | Till | 1-Nov | AM/NV/BW | 532097 | 6083249 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT004 | Till | 1-Nov | AM/NV/BW | 531892 | 6083088 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT005 | Till | 1-Nov | AM/NV/BW | 531747 | 6082889 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT006 | Till | 1-Nov | AM/NV/BW | 531678 | 6082622 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT007 | Till | 1-Nov | AM/NV/BW | 531675 | 6082393 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT008 | Till | 1-Nov | AM/NV/BW | 531735 | 6082142 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT009 | Till | 2-Nov | AM/NV/BW | 531675 | 6081661 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT010 | Till | 2-Nov | AM/NV/BW | 532128 | 6081408 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT011 | Till | 2-Nov | AM/NV/BW | 531095 | 6077657 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT012 | Till | 3-Nov | NV/AM | 529235 | 6075769 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT013 | Till | 3-Nov | NV/AM | 529466 | 6075843 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT014 | Till | 3-Nov | NV/AM | 529591 | 6075905 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT015 | Till | 3-Nov | NV/AM | 529959 | 6076228 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT016 | Till | 3-Nov | NV/AM | 530190 | 6076336 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT017 | Till | 3-Nov | NV/AM | 530431 | 6076424 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT018 | Till | 3-Nov | NV/AM | 530639 | 6076587 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT019 | Till | 5-Nov | AM/NV | 530986 | 6076674 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT020 | Till | 5-Nov | AM/NV | 531214 | 6077145 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT021 | Till | 6-Nov | AM/NV/PW | 531054 | 6078181 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT022 | Till | 6-Nov | AM/NV/PW | 531131 | 6078642 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT023 | Till | 6-Nov | AM/NV/PW | 531248 | 6078867 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |

**2002 - 2003 Sample List - Swan Hills Property**
**Sovereign Mining and Exploration Ltd.**

| Sample Number | Sample Type | Date | Sampler | UTM_Easting N27 | UTM_Northing N27 | Zone | Analysis Type | Result Received |
|---|---|---|---|---|---|---|---|---|
| 03NVT024 | Till | 6-Nov | AM/NV/PW | 531494 | 6078925 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT025 | Till | 6-Nov | AM/NV/PW | 531773 | 6079605 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT026 | Till | 6-Nov | AM/NV/PW | 531696 | 6079072 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT027 | Till | 6-Nov | AM/NV/PW | 531828 | 6080153 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT028 | Till | 6-Nov | AM/NV/PW | 531869 | 6080625 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT029 | Till | 6-Nov | AM/NV/PW | 532404 | 6081079 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT030 | Till | 9-Nov | PW/AM/NV | 527472 | 6090112 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT031 | Till | 8-Nov | PW/AM/NV | 526661 | 6088821 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT032 | Till | 9-Nov | PW/AM/NV | 527297 | 6089887 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT033 | Till | 9-Nov | PW/AM/NV | 527066 | 6089829 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT034 | Till | 9-Nov | PW/AM/NV | 527117 | 6089501 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT035 | Till | 9-Nov | PW/AM/NV | 526942 | 6089292 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT036 | Till | 9-Nov | PW/AM/NV | 526493 | 6088622 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT037 | Till | 9-Nov | PW/AM/NV | 526375 | 6088391 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT038 | Till | 9-Nov | PW/AM/NV | 526210 | 6088204 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT039 | Till | 9-Nov | PW/AM/NV | 526095 | 6087995 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT040 | Till | 9-Nov | PW/AM/NV | 525903 | 6087744 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT041 | Till | 10-Nov | NV/AM/PW | 522839 | 6083175 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT042 | Till | 10-Nov | NV/AM/PW | 522985 | 6083408 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT043 | Till | 10-Nov | NV/AM/PW | 523119 | 6083625 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT044 | Till | 10-Nov | NV/AM/PW | 523272 | 6083825 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT045 | Till | 10-Nov | NV/AM/PW | 523462 | 6084143 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT046 | Till | 10-Nov | NV/AM/PW | 523621 | 6084339 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT047 | Till | 10-Nov | NV/AM/PW | 523742 | 6084549 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT048 | Till | 10-Nov | NV/AM/PW | 523947 | 6084854 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT049 | Till | 10-Nov | NV/AM/PW | 524120 | 6085111 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT050 | Till | 10-Nov | NV/AM/PW | 524277 | 6085309 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT051 | Till | 11-Nov | AM/PW | 524408 | 6085528 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT052 | Till | 11-Nov | AM/PW | 524566 | 6085755 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT053 | Till | 11-Nov | AM/PW | 524707 | 6085954 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT054 | Till | 11-Nov | AM/PW | 524833 | 6086164 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT055 | Till | 11-Nov | AM/PW | 524987 | 6086366 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT056 | Till | 11-Nov | AM/PW | 525140 | 6086583 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT057 | Till | 11-Nov | AM/PW | 525253 | 6086787 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT058 | Till | 11-Nov | AM/PW | 525390 | 6087019 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT059 | Till | 12-Nov | PW/AM | 525547 | 6087208 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT060 | Till | 12-Nov | PW/AM | 522679 | 6082949 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT061 | Till | 12-Nov | PW/AM | 525692 | 6087388 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT062 | Till | 12-Nov | PW/AM | 525789 | 6087574 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT063 | Till | 15-Nov | AM/PW | 531523 | 6094924 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT064 | Till | 15-Nov | AM/PW | 532036 | 6094937 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT065 | Till | 15-Nov | AM/PW | 532527 | 6094895 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT066 | Till | 17-Nov | PW/AM | 533013 | 6094830 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT067 | Till | 17-Nov | PW/AM | 533541 | 6094840 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT068 | Till | 17-Nov | PW/AM | 534044 | 6094808 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT069 | Till | 17-Nov | PW/AM | 534557 | 6094768 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT070 | Till | 17-Nov | PW/AM | 535047 | 6094705 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT071 | Till | 17-Nov | PW/AM | 535550 | 6094679 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT072 | Till | 17-Nov | PW/AM | 536122 | 6094641 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT073 | Till | 17-Nov | PW/AM | 536619 | 6094676 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT074 | Till | 17-Nov | PW/AM | 537157 | 6094714 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT075 | Till | 17-Nov | PW/AM | 537648 | 6094675 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT076 | Till | 18-Nov | AM/PW | 538206 | 6094984 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT077 | Till | 18-Nov | AM/PW | 538641 | 6095146 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT078 | Till | 18-Nov | AM/PW | 539078 | 6095391 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT079 | Till | 18-Nov | AM/PW | 539578 | 6095533 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT080 | Till | 18-Nov | AM/PW | 540067 | 6094564 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |

## 2002 - 2003 Sample List - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Date | Sampler | UTM_Easting N27 | UTM_Northing N27 | Zone | Analysis Type | Result Received |
|---|---|---|---|---|---|---|---|---|
| 03NVT081 | Till | 23-Nov | AM/PW | 522519 | 6098433 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT082 | Till | 23-Nov | AM/PW | 522741 | 6098572 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT083 | Till | 23-Nov | AM/PW | 522958 | 6098688 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT084 | Till | 23-Nov | AM/PW | 523182 | 6098810 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT085 | Till | 25-Nov | PW/AM | 521633 | 6097935 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT086 | Till | 25-Nov | PW/AM | 521873 | 6098028 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT087 | Till | 25-Nov | PW/AM | 522077 | 6098152 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT088 | Till | 25-Nov | PW/AM | 522311 | 6098304 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT089 | Till | 26-Nov | PW/AM | 523422 | 6098946 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT090 | Till | 26-Nov | AM/PW | 521253 | 6097626 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT091 | Till | 26-Nov | AM/PW | 521458 | 6097783 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT092 | Till | 27-Nov | PW/AM | 521010 | 6097460 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT093 | Till | 27-Nov | PW/AM | 520807 | 6097380 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT094 | Till | 27-Nov | PW/AM | 520054 | 6096912 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT095 | Till | 27-Nov | PW/AM | 519844 | 6096802 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT096 | Till | 27-Nov | PW/AM | 519648 | 6096672 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT097 | Till | 28-Nov | AM/PW | 519449 | 6096537 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT098 | Till | 28-Nov | AM/PW | 519240 | 6096397 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT099 | Till | 28-Nov | AM/PW | 519029 | 6096261 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT100 | Till | 28-Nov | AM/PW | 518828 | 6096099 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT101 | Till | 28-Nov | AM/PW | 518648 | 6095937 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT102 | Till | 28-Nov | AM/PW | 518456 | 6095776 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT103 | Till | 28-Nov | AM/PW | 518249 | 6095600 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT104 | Till | 29-Nov | PW/AM | 518042 | 6095459 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT105 | Till | 29-Nov | PW/AM | 523631 | 6099089 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT106 | Till | 29-Nov | PW/AM | 523949 | 6099289 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT107 | Till | 29-Nov | PW/AM | 524152 | 6099450 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT108 | Till | 29-Nov | PW/AM | 524391 | 6099563 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT109 | Till | 29-Nov | PW/AM | 524617 | 6099676 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT110 | Till | 2-Dec | PW/AM | 516134 | 6094400 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT111 | Till | 2-Dec | PW/AM | 515933 | 6094289 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT112 | Till | 2-Dec | PW/AM | 515716 | 6094159 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT113 | Till | 15-Dec | PW/AM | 516573 | 6114682 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT114 | Till | 15-Dec | PW/AM | 515555 | 6114622 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT115 | Till | 15-Dec | PW/AM | 514865 | 6115384 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT116 | Till | 15-Dec | PW/AM | 514124 | 6114911 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT117 | Till | 15-Dec | PW/AM | 513190 | 6114535 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT118 | Till | 15-Dec | PW/AM | 512481 | 6113794 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT119 | Till | 15-Dec | PW/AM | 512280 | 6112801 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT120 | Till | 15-Dec | PW/AM | 511131 | 6112245 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT121 | Till | 15-Dec | PW/AM | 510072 | 6112328 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT122 | Till | 15-Dec | PW/AM | 509008 | 6112065 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT123 | Till | 15-Dec | PW/AM | 507766 | 6111994 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT124 | Till | 15-Dec | PW/AM | 506512 | 6111963 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT125 | Till | 20-Dec | PW/AM/BA | 547681 | 6037671 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT126 | Till | 20-Dec | PW/AM/BA | 547024 | 6037227 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT127 | Till | 20-Dec | PW/AM/BA | 546528 | 6036566 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT128 | Till | 21-Dec | PW/AM/BA | 546029 | 6036334 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT129 | Till | 21-Dec | PW/AM/BA | 545558 | 6036426 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT130 | Till | 21-Dec | PW/AM/BA | 545105 | 6036629 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT131 | Till | 21-Dec | PW/AM/BA | 544709 | 6037032 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT132 | Till | 21-Dec | PW/AM/BA | 544203 | 6036844 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT133 | Till | 21-Dec | PW/AM/BA | 543810 | 6036638 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT134 | Till | 21-Dec | PW/AM/BA | 543339 | 6036969 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT135 | Till | 21-Dec | PW/AM/BA | 542976 | 6037330 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT136 | Till | 21-Dec | PW/AM/BA | 542473 | 6037428 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT137 | Till | 21-Dec | PW/AM/BA | 542053 | 6037114 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |

**2002 - 2003 Sample List - Swan Hills Property**
**Sovereign Mining and Exploration Ltd.**

| Sample Number | Sample Type | Date | Sampler | UTM_Easting N27 | UTM_Northing N27 | Zone | Analysis Type | Result Received |
|---|---|---|---|---|---|---|---|---|
| 03NVT138 | Till | 21-Dec | PW/AM/BA | 541673 | 6036668 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT139 | Till | 21-Dec | PW/AM/BA | 541173 | 6036222 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT140 | Till | 21-Dec | PW/AM/BA | 540675 | 6035936 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT141 | Till | 21-Dec | PW/AM/BA | 540390 | 6035442 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT142 | Till | 21-Dec | PW/AM/BA | 540286 | 6034954 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT143 | Till | 21-Dec | PW/AM/BA | 540015 | 6034403 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT144 | Till | 21-Dec | PW/AM/BA | 539642 | 6033903 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT145 | Till | 21-Dec | PW/AM/BA | 539433 | 6033397 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT146 | Till | 21-Dec | PW/AM/BA | 539005 | 6033224 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT147 | Till | 22-Dec | BA/PW/AM | 556158 | 6031855 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT148 | Till | 22-Dec | BA/PW/AM | 555805 | 6031468 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT149 | Till | 22-Dec | BA/PW/AM | 555568 | 6030985 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT150 | Till | 22-Dec | BA/PW/AM | 555773 | 6030531 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT151 | Till | 22-Dec | BA/PW/AM | 556229 | 6030148 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT152 | Till | 22-Dec | BA/PW/AM | 566328 | 6041870 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT153 | Till | 22-Dec | BA/PW/AM | 567688 | 6043455 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT154 | Till | 22-Dec | BA/PW/AM | 568884 | 6045163 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT155 | Till | 22-Dec | BA/PW/AM | 570619 | 6046593 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT156 | Till | 22-Dec | BA/PW/AM | 572284 | 6048023 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT400 | Till | 12-Dec | PW/AM/MD | 539573 | 6092586 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT401 | Till | 12-Dec | PW/AM/MD | 539788 | 6092519 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT402 | Till | 13-Dec | AM/PW/MD | 540017 | 6092636 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT403 | Till | 13-Dec | AM/PW/MD | 539933 | 6092705 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT404 | Till | 13-Dec | AM/PW/MD | 539842 | 6092720 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT405 | Till | 14-Dec | MD | 540313 | 6092565 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| 03NVT406 | Till | 14-Dec | MD | 540313 | 6092565 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | Yes |
| D-03-01-001 | Drill Tailings Composite | 16-Dec | AM | 541598 | 6092573 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-002 | Drill Tailings Composite | 16-Dec | AM | 541499 | 6092576 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-003 | Drill Tailings Composite | 16-Dec | AM | 541310 | 6092572 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-004 | Drill Tailings Composite | 16-Dec | AM | 541098 | 6092568 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-005 | Drill Tailings Composite | 16-Dec | AM | 541004 | 6092552 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-006 | Drill Tailings Composite | 16-Dec | AM | 540706 | 6092543 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-007 | Drill Tailings Composite | 16-Dec | AM | 540517 | 6092533 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-008 | Drill Tailings Composite | 16-Dec | AM | 540417 | 6092535 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-009 | Drill Tailings Composite | 16-Dec | AM | 540309 | 6092532 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-010 | Drill Tailings Composite | 16-Dec | AM | 540190 | 6092521 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-011 | Drill Tailings Composite | 17-Dec | BA/PW | 540045 | 6092496 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-012 | Drill Tailings Composite | 17-Dec | BA/PW | 539450 | 6092487 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-013 | Drill Tailings Composite | 17-Dec | BA/PW | 538723 | 6092451 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-014 | Drill Tailings Composite | 17-Dec | BA/PW | 538020 | 6092428 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-015 | Drill Tailings Composite | 17-Dec | BA/AM/PW | 539112 | 6092349 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-016 | Drill Tailings Composite | 17-Dec | BA/AM/PW | 538640 | 6091595 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-017 | Drill Tailings Composite | 17-Dec | BA/AM/PW | 539388 | 6092790 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-018 | Drill Tailings Composite | 17-Dec | BA/AM/PW | 539709 | 6093287 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-019 | Drill Tailings Composite | 18-Dec | PW | 541687 | 6091474 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-020 | Drill Tailings Composite | 18-Dec | PW | 541015 | 6091900 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-021 | Drill Tailings Composite | 18-Dec | PW | 540449 | 6092234 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-01-022 | Drill Tailings Composite | 18-Dec | PW | 540068 | 6092459 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-001 | Drill Tailings Composite | 16-Dec | AM/PW | 535357 | 6092314 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-002 | Drill Tailings Composite | 16-Dec | AM/PW | 535371 | 6092303 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-003 | Drill Tailings Composite | 17-Dec | BA | 537721 | 6092418 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-004 | Drill Tailings Composite | 18-Dec | BA | 537418 | 6094251 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-005 | Drill Tailings Composite | 18-Dec | BA | 537895 | 6093899 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-006 | Drill Tailings Composite | 18-Dec | BA | 539183 | 6092997 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-007 | Drill Tailings Composite | 18-Dec | BA/PW | 539566 | 6092765 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| D-03-02-008 | Drill Tailings Composite | 18-Dec | BA/PW | 539854 | 6092601 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH001 | Pan Concentrate (HMC) | 14-Nov | AM/MD/PW | 528740 | 6094548 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |

**2002 - 2003 Sample List - Swan Hills Property**
**Sovereign Mining and Exploration Ltd.**

| Sample Number | Sample Type | Date | Sampler | UTM_Easting N27 | UTM_Northing N27 | Zone | Analysis Type | Result Received |
|---|---|---|---|---|---|---|---|---|
| 03AMH002 | Pan Concentrate (HMC) | 15-Nov | AM/MD/PW | 527696 | 6095668 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH003 | Pan Concentrate (HMC) | 16-Nov | AM/MD/PW | 508037 | 6132106 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH004 | Pan Concentrate (HMC) | 16-Nov | PW/MD/AM | 502498 | 6119965 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH005 | Pan Concentrate (HMC) | 16-Nov | AM/MD/PW | 508000 | 6122246 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH006 | Pan Concentrate (HMC) | 19-Nov | AM/PW | 541042 | 6094509 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH007 | Pan Concentrate (HMC) | 20-Nov | AM/PW | 539984 | 6090395 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH008 | Pan Concentrate (HMC) | 20-Nov | AM/PW | 539843 | 6097006 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH009 | Pan Concentrate (HMC) | 20-Nov | AM/PW | 538813 | 6113789 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH010 | Pan Concentrate (HMC) | 21-Nov | PW/AM | 511968 | 6089325 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH011 | Pan Concentrate (HMC) | 1-Dec | AM/PW | 525786 | 6094728 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH012 | Pan Concentrate (HMC) | 3-Dec | AM/PW | 516164 | 6091847 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| 03AMH013 | Pan Concentrate (HMC) | 6-Dec | PW/AM | 516201 | 6091156 | 11 | Table for Gold Grains, Diamond Indicator Process and Pick | No |
| P-03-01-001 | Rock Grab | 12-Dec | MD/AM/PW | 539788 | 6092519 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-01-002 | Rock Grab | 12-Dec | MD/AM/PW | 539788 | 6092519 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-01-003 | Rock Grab | 12-Dec | MD/AM/PW | 539788 | 6092519 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-02-001 | Rock Grab | 12-Dec | MD/AM/PW | 539573 | 6092586 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-02-002 | Rock Grab | 12-Dec | MD/AM/PW | 539573 | 6092586 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-02-003 | Rock Grab | 12-Dec | MD/AM/PW | 539573 | 6092586 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-02-004 | Rock Grab | 12-Dec | MD/AM/PW | 539573 | 6092586 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-02-005 | Rock Grab | 12-Dec | MD/AM/PW | 539573 | 6092586 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-02-006 | Rock Grab | 12-Dec | MD/AM/PW | 539573 | 6092586 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-03-001 | Rock Grab | 13-Dec | MD/AM/PW | 540025 | 6092638 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-03-002 | Rock Grab | 13-Dec | MD/AM/PW | 540025 | 6092638 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-03-003 | Rock Grab | 13-Dec | MD/AM/PW | 540025 | 6092638 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-03-004 | Rock Grab | 13-Dec | MD/AM/PW | 540025 | 6092638 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-04-001 | Rock Grab | 13-Dec | MD/AM/PW | 539937 | 6092710 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-04-002 | Rock Grab | 13-Dec | MD/AM/PW | 539937 | 6092710 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-04-003 | Rock Grab | 13-Dec | MD/AM/PW | 539937 | 6092710 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-05-001 | Rock Grab | 13-Dec | MD/AM/PW | 539847 | 6092717 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-06-001 | Rock Grab | 14-Dec | MD | 540313 | 6092565 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-06-002 | Rock Grab | 14-Dec | MD | 540313 | 6092565 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-06-003 | Rock Grab | 14-Dec | MD | 540313 | 6092565 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-06-004 | Rock Grab | 14-Dec | MD | 540313 | 6092565 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-07-001 | Rock Grab | 14-Dec | AM | 539946 | 6092559 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-07-002 | Rock Grab | 14-Dec | AM | 539946 | 6092559 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-07-003 | Rock Grab | 14-Dec | AM | 539946 | 6092559 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-07-004 | Rock Grab | 14-Dec | AM | 539946 | 6092559 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| P-03-07-005 | Rock Grab | 14-Dec | AM | 539946 | 6092559 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| T-03-01-001 | Rock Grab | 14-Dec | AM | 539942 | 6092544 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| T-03-01-002 | Rock Grab | 14-Dec | AM | 539942 | 6092544 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| T-03-01-003 | Rock Grab | 14-Dec | AM | 539942 | 6092544 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| T-03-01-004 | Rock Grab | 14-Dec | AM | 539942 | 6092544 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |
| T-03-01-005 | Rock Grab | 14-Dec | AM | 539942 | 6092544 | 11 | Whole Rock, Au & Multielement ICP by aqua regia | Yes |

## 2003 Trench/Pit Locations, Elevations and Geology - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| | | | |
|---|---|---|---|
| Trench Pit 03-01: | | | |
| Surveyed Elev. (m a.s.l.): | 833.432 | Samples*: | |
| | | | |
| 826.73 | 0 ft. | | grey silty bentonitic mudstone |
| | | P-03-01-003 | |
| 827.64 | 3 ft. | | green micaceous bentonitic siltstone |
| | | P-03-01-001 | |
| 828.25 | 5 ft. | | brown regolith developed on silty bentonitic rock - some Fe stain |
| | | P-03-01-002 | |
| 829.01 | 7.5 ft. | | good basal till with loads of local bedrock - organics |
| Trench Pit 03-02: | | | |
| Surveyed Elev. (m a.s.l.): | 846.684 | Samples: | |
| | | | |
| 839.98 | 0 ft. | | dark grey bentonitic mudstone to bentonite - some green tinted material |
| | | P-03-02-002, P-03-02-003 | |
| 840.59 | 2 ft. | | rusty silty zone |
| | | | |
| 841.29 | 4.3 ft. | | light grey low Fe silty unit |
| | | P-03-02-004 | |
| 842.11 | 7 ft. | | Fe stained, same silt rich unit |
| | | | |
| 843.18 | 10.5 ft. | | light grey silt rich bentonitic unit |
| | | P-03-02-001 | |
| 844.40 | 14.5 ft. | | brown-stained organic rich unit - some Fe |
| | | P-03-02-005 | |
| 844.86 | 16 ft. | | grey to Fe stained silty clay bentonitic unit |
| | | P-03-02-006 | |
| 845.54 | 18.25 ft. | | organic rich zone, likely regolith |
| | | | |
| 846.23 | 20.5 ft. | | Fe stained sand lenses and reworked till |
| Trench Pit 03-03: | | | |
| Surveyed Elev. (m a.s.l.): | 831.517 | | |
| | | Samples: | |
| 824.81 | 0 ft. | | nice grey massive weathering blocky tan bentonitic unit, conchoidal fracture, not very dense, good bentonitic mudstone, no planar cleavage |
| | | P-03-03-001 | |
| 825.73 | 3 ft. | | P-03-03-004 combines P-03-03-001 and -002 material for bulk sample |
| | | P-03-03-002 | |
| 826.95 | 7 ft. | | yellow weathered version of same massive blocky unit of bentonitic material |
| | | P-03-03-003 | |
| 828.47 | 12 ft. | | dark brown paleosol developed in lower till to upper bedrock |
| | | | |
| 829.08 | 14 ft. | | brown, clay rich till |
| Trench Pit 03-04: | | | |
| Suveyed Elev. (m a.s.l.): | 835.203 | | |
| | | Samples: | |
| 828.50 | 0 ft. | | rusty sandstone (red) and blocky black organic rich mudstone - minor blocks of green bentonite, weathered bentonitic mudstone |
| | | P-03-04-001 | |
| 829.41 | 3 ft. | | black pedogenic mudstone zone developed on sst-shale bedrock - red Fe stain, reddish-brown blocky sandy siltstone in often around coal. Red colour is because of weathering - lies under till layer that allows water to percolate down and weather the rock |
| | | P-03-04-002 | |
| 830.33 | 6 ft. | | till going from bedrock rich clay to boulder-cobble rich clay with abundant foreign clasts |
| Trench Pit 03-05: | | | |
| Suveyed Elev. (m a.s.l.): | 839.195 | | |
| | | Samples: | |
| 832.61 - 835.05 | 0 - 8 ft. E side of pit | | yellow tan sandstone |
| | | P-03-05-001 | |
| 832.61 - 836.73 | 0-13.5 ft. W side of pit | | yellow tan sandstone (sloped contact) |
| | | | |
| 835.05/836.73 | 8/13.5 ft. | | brown till |
| Trench Pit 03-06: | | | |
| Suveyed Elev. (m a.s.l.): | 822.447 | | |
| | | Samples: | |
| 816.05 | 0 ft. | | bright green @ bottom to light green tan bentonitic clay |
| | | P-03-06-001 | |
| 816.96 | 3 ft. | | |
| | | P-03-06-002 | |
| 817.57 | 5 ft. | P-03-06-003 | just below black coal seam |
| 817.88 | 6 ft. | P-03-06-004 | black coal to dirty coal - sub bituminous to bituminous coal |
| | | | |
| 818.64 | 8.5 ft. | | dark brown to green till sitting on the coal |
| | | | |
| 819.40 | 11 ft. | | typical brown till that seen in all holes |

## 2003 Trench/Pit Locations, Elevations and Geology - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| | | | |
|---|---|---|---|
| Trench Pit 03-07: | | | |
| Suveyed Elev. (m a.s.l.): | 832.776 | | |
| | (pit 19 ft. deep) | Samples: | |
| 826.98 | 0 ft. | | start of bentonitic zone that may likely be in Pit 03-03, composite sample taken (P-03-07-005), finely laminated bentonite, very iron stained, under thick sandy unit. |
| | | P-03-07-005 | |
| 828.81 | 6 ft. | | yellow-orange sand layer |
| | | P-03-07-001 | |
| 830.95 | 13 ft. | | Fe stained, very blocky competent bentonitic mudstone unit, ~grey colour to tan, massive (P-03-07-002) |
| | | P-03-07-002 | |
| 832.47 | 18 ft. | | mottled, partly blocky yellow brown bentonitic unit - P-03-07-003 |
| | | T-03-01-001 | |
| 833.08 | 20 ft. (above surface on o/c wall) | | yellow weathered bentonitic unit below paleosoil - P-03-07-004 |
| | | T-03-01-002 | |
| 833.23 | 21.5 ft. | | grey blocky laminated bentonitic unit |
| | | T-03-01-003 | |
| 834.91 | 26 ft. | | |
| | | T-03-01-004 | |
| 835.82 | 29 ft. | | more massive blocky grey bentonitic unit with increasing yellow colour - weathering towards brown till contact |
| | | T-03-01-005 | |
| 837.65 | 35 ft. | | brown till |
| | | | |
| PIT 03-01 | 539788 | 6092519 | |
| PIT 03-02 | 539573 | 6092586 | |
| PIT 03-03 | 540025 | 6092638 | |
| PIT 03-04 | 539937 | 6092710 | |
| PIT 03-05 | 539847 | 6092717 | |
| PIT 03-06 | 540313 | 6092565 | |
| PIT 03-07 | 539946 | 6092559 | |
| Spearhead Gas Well: | | | |
| Ground Elevation: | 833.5 m a.s.l. | | |
| KB Elevation: | 838.5 m a.s.l. | | |
| *Sample numbers are between elevations to represent the interval from which they were taken | | | |

PIT Locations are all in UTM Coordinates in Zone 11, NAD1927

# APPENDIX 2
# 2002-2003 GROUND GEOPHYSICAL DATA AND RESULTS

# Ground Geophysical Grids - 2002
# Sovereign Mining and Exploration Ltd.

| Anomaly | Grid | GridSize | utmx_n27 | utmy_n27 | Remark |
|---|---|---|---|---|---|
| CS6-7 | CS6-7 | 400x550m | 553445 | 6075900 | Location = center of grid |
| S5a | APEX31 | 700x800m | 542990 | 6063100 | Center of anomaly |
| S5b | APEX31 | 700x800m | 543250 | 6062800 | Center of anomaly |

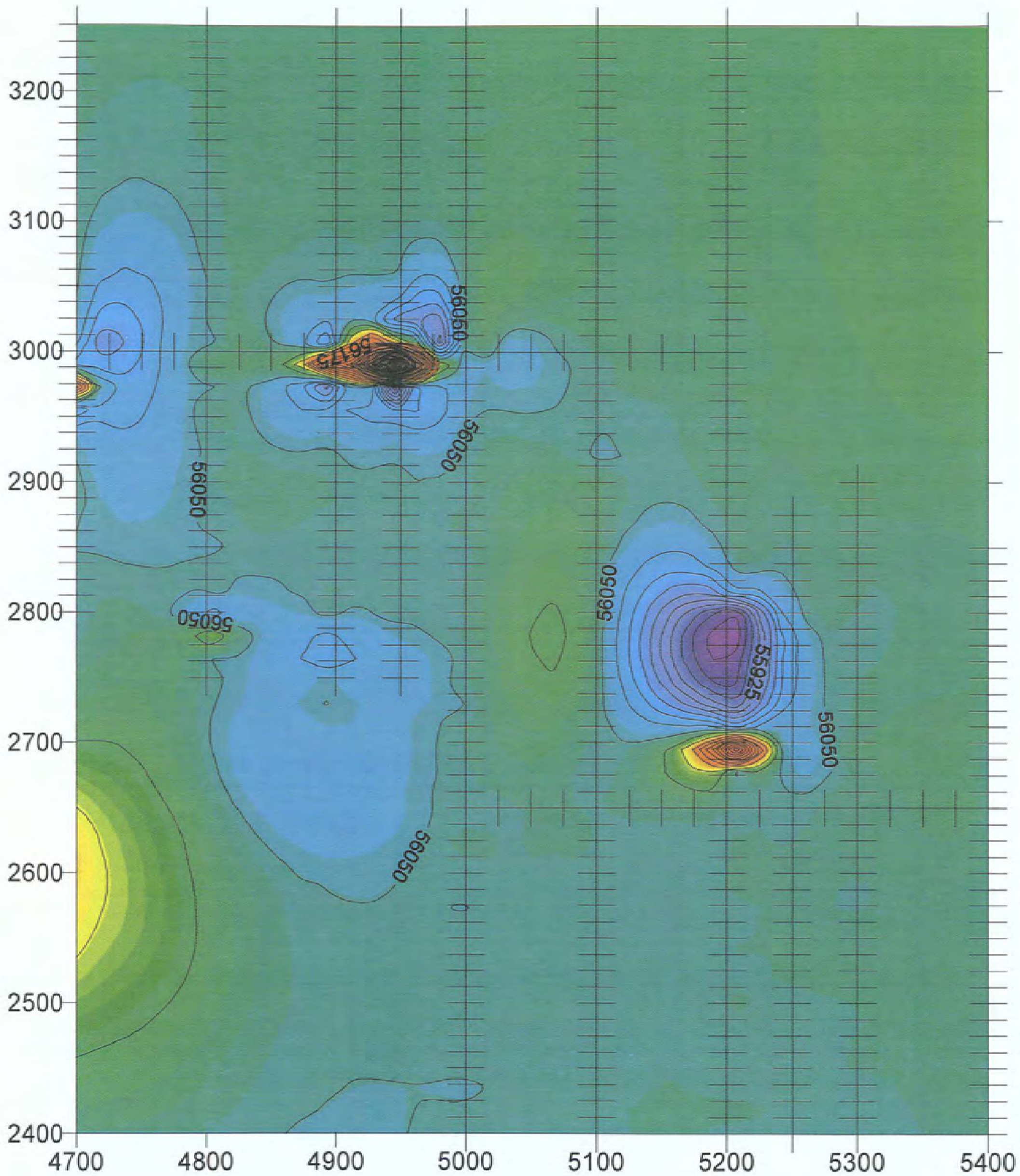
**Grid Coordinates**
**UTM Z11, NAD27**

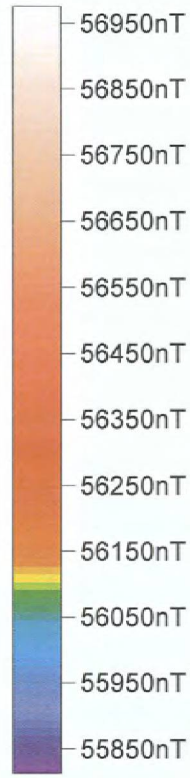
52+00E:30+00N =
543247E:6063120N

47+00E:30+00N =
542740E:6063102N

47+00E:28+00N =
542749E:6062900N

50+00E:24+00N =
543048E:6062527N



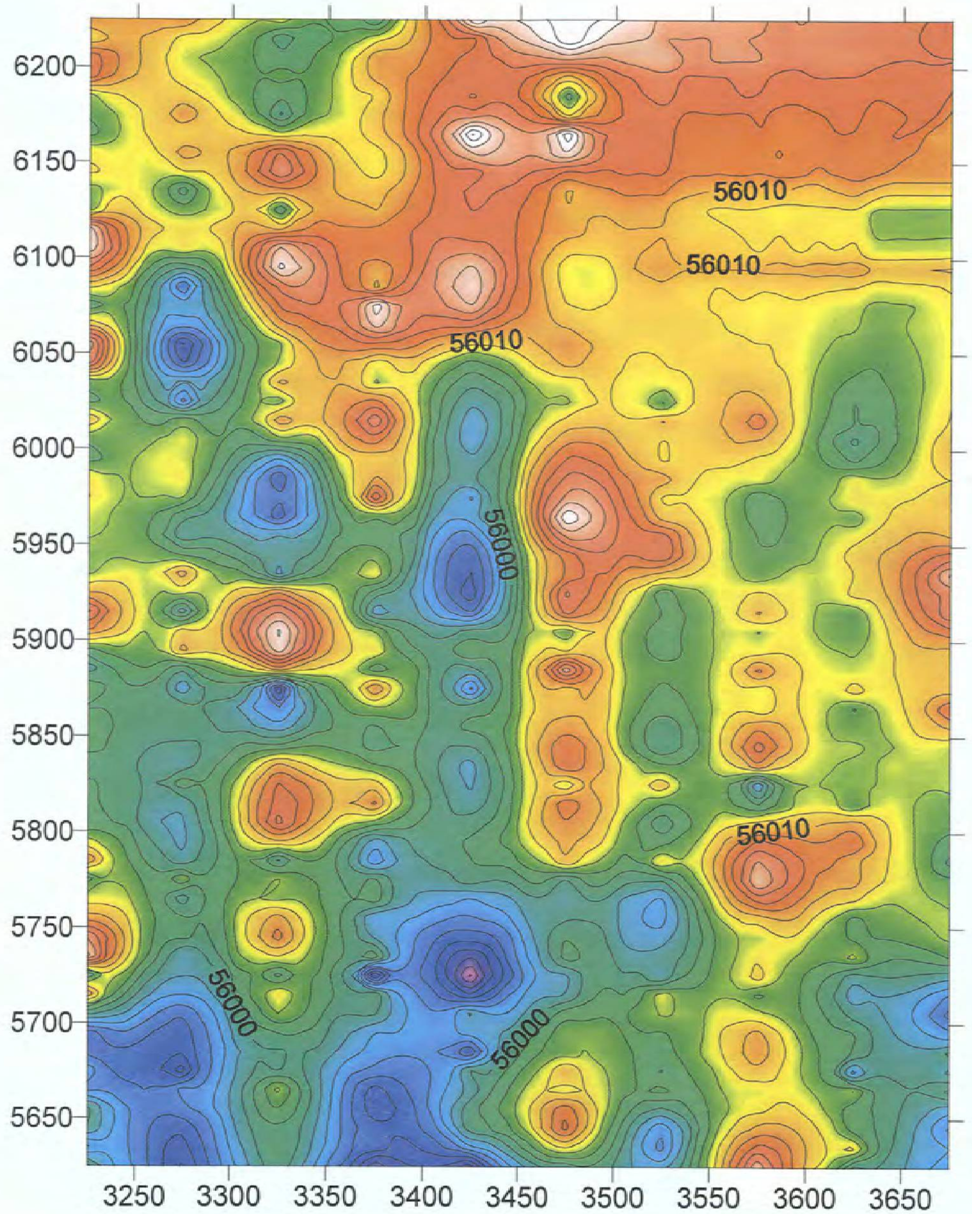

Contour Interval = 25nT

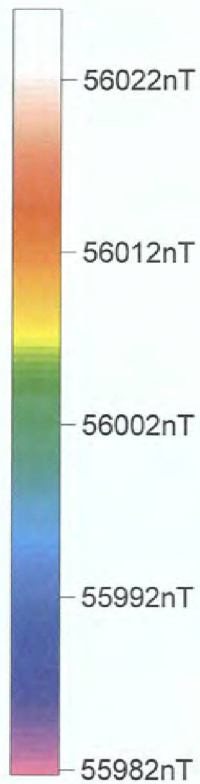
**Ground Magnetics**
**For Airborne Anomaly S5**
**A and B (APEX Anomaly 31)**

Sovereign Mining & Exploration Ltd.
APEX Geoscience Ltd.
Fall, 2002

**Grid Coordinates**
**UTM Z11, NAD27**

35+50E:57+00N =
553545E:6075700N




Contour Interval = 2nT

**Ground Magnetics**
**For Airborne Anomalies**
**CS6 and CS7**

Sovereign Mining & Exploration Ltd.

APEX Geoscience Ltd.
Fall, 2002

## Raw Diurnal Corrected Magnetic Data - S5AB
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 153950 | 5200 | 3000 | 58457.67 | 56055.54 | 99 |
| 154022 | 5175 | 3000 | 58457.55 | 56054.53 | 99 |
| 154106 | 5150 | 3000 | 58462.37 | 56058.42 | 99 |
| 154146 | 5125 | 3000 | 58462.21 | 56057.62 | 99 |
| 154218 | 5100 | 3000 | 58461.56 | 56057.03 | 99 |
| 154250 | 5075 | 3000 | 58454.04 | 56050.52 | 99 |
| 154322 | 5050 | 3000 | 58446.07 | 56043.92 | 99 |
| 154358 | 5025 | 3000 | 58443.73 | 56042.68 | 99 |
| 154430 | 5000 | 3000 | 58436.62 | 56035.7 | 99 |
| 154506 | 4975 | 3000 | 58318.22 | 55916.7 | 99 |
| 91238 | 4950 | 3000 | 58567.23 | 56229.19 | 99 |
| 91322 | 4925 | 3000 | 58522.93 | 56183.16 | 99 |
| 91354 | 4900 | 3000 | 58298.23 | 55962.57 | 99 |
| 91426 | 4875 | 3000 | 58367.36 | 56029.15 | 99 |
| 91458 | 4850 | 3000 | 58386.04 | 56047.47 | 99 |
| 91530 | 4825 | 3000 | 58396.44 | 56060.25 | 99 |
| 91602 | 4800 | 3000 | 58381.44 | 56048.45 | 99 |
| 91634 | 4775 | 3000 | 58378.9 | 56035.21 | 99 |
| 91710 | 4750 | 3000 | 58333.29 | 56002.11 | 99 |
| 91738 | 4725 | 3000 | 58293.3 | 55963.59 | 99 |
| 91806 | 4700 | 3000 | 58356.34 | 56018.67 | 99 |
| 92458 | 4700 | 3250 | 58392.34 | 56055.85 | 99 |
| 92518 | 4700 | 3237.5 | 58387.31 | 56055.1 | 99 |
| 92538 | 4700 | 3225 | 58387.47 | 56055.41 | 99 |
| 92558 | 4700 | 3212.5 | 58391.63 | 56054.25 | 99 |
| 92614 | 4700 | 3200 | 58394.59 | 56056.11 | 99 |
| 92634 | 4700 | 3187.5 | 58393.58 | 56055 | 99 |
| 92658 | 4700 | 3175 | 58394.79 | 56055.3 | 99 |
| 92718 | 4700 | 3162.5 | 58396.16 | 56054.92 | 99 |
| 92742 | 4700 | 3150 | 58397.99 | 56053.85 | 99 |
| 92802 | 4700 | 3137.5 | 58403.09 | 56055.36 | 99 |
| 92822 | 4700 | 3125 | 58404.42 | 56054.05 | 99 |
| 92842 | 4700 | 3112.5 | 58406.3 | 56053.83 | 99 |
| 92938 | 4700 | 3100 | 58407.02 | 56052.81 | 99 |
| 93002 | 4700 | 3087.5 | 58407.13 | 56053.62 | 99 |
| 93022 | 4700 | 3075 | 58405.87 | 56053.16 | 99 |
| 93042 | 4700 | 3062.5 | 58403.05 | 56052.1 | 99 |
| 93102 | 4700 | 3050 | 58400.41 | 56051.62 | 99 |
| 93122 | 4700 | 3037.5 | 58395.81 | 56049 | 99 |
| 93138 | 4700 | 3025 | 58391.03 | 56045.78 | 99 |
| 93154 | 4700 | 3012.5 | 58384.61 | 56040.75 | 99 |
| 93210 | 4700 | 3000 | 58362.5 | 56019.19 | 99 |
| 93226 | 4700 | 2987.5 | 58331.96 | 55989.26 | 99 |
| 93250.7 | 4700 | 2975 | 58548.32 | 56207.36 | 99 |
| 93310 | 4700 | 2962.5 | 58286.49 | 55947.22 | 99 |
| 93330 | 4700 | 2950 | 58357.85 | 56019.48 | 99 |
| 93350 | 4700 | 2937.5 | 58380.26 | 56042.77 | 99 |
| 93410 | 4700 | 2925 | 58382.91 | 56046.01 | 99 |
| 93434 | 4700 | 2912.5 | 58389.11 | 56052.29 | 99 |
| 93454 | 4700 | 2900 | 58387.91 | 56051.88 | 99 |
| 93514 | 4700 | 2887.5 | 58388.41 | 56052.93 | 99 |
| 93534 | 4700 | 2875 | 58385.72 | 56050.82 | 99 |
| 93554 | 4700 | 2862.5 | 58383.06 | 56049.78 | 99 |
| 93614 | 4700 | 2850 | 58380.89 | 56049.76 | 99 |
| 93634 | 4700 | 2837.5 | 58378.58 | 56049.56 | 99 |
| 93654 | 4700 | 2825 | 58379.22 | 56051.52 | 99 |
| 93714 | 4700 | 2812.5 | 58381.82 | 56054.31 | 99 |
| 93734 | 4700 | 2800 | 58380.85 | 56052.56 | 99 |
| 94134 | 4800 | 2750 | 58379.93 | 56052.11 | 99 |
| 94154 | 4800 | 2762.5 | 58377.75 | 56049.63 | 99 |
| 94214 | 4800 | 2775 | 58381.48 | 56053.27 | 99 |
| 94238 | 4800 | 2787.5 | 58452.43 | 56123.69 | 99 |
| 94310 | 4800 | 2800 | 58347.05 | 56018.81 | 99 |
| 94334.6 | 4800 | 2812.5 | 58380.84 | 56053.42 | 99 |
| 94354 | 4800 | 2825 | 58382.55 | 56054.74 | 99 |
| 94414 | 4800 | 2837.5 | 58379.75 | 56050.63 | 99 |
| 94438 | 4800 | 2850 | 58378.4 | 56048.38 | 99 |
| 94506 | 4800 | 2862.5 | 58380.12 | 56048.28 | 99 |
| 94534 | 4800 | 2875 | 58389.62 | 56056.05 | 99 |
| 94558 | 4800 | 2887.5 | 58388.26 | 56052.77 | 99 |
| 94618 | 4800 | 2900 | 58392.58 | 56054.82 | 99 |
| 94638 | 4800 | 2912.5 | 58393.56 | 56054.23 | 99 |
| 94702 | 4800 | 2925 | 58392.28 | 56051.63 | 99 |
| 94722 | 4800 | 2937.5 | 58396.56 | 56054.88 | 99 |
| 94746 | 4800 | 2950 | 58402.07 | 56060.57 | 99 |
| 94806 | 4800 | 2962.5 | 58398.12 | 56056.36 | 99 |
| 94830 | 4800 | 2975 | 58391.99 | 56049.38 | 99 |
| 94858 | 4800 | 2987.5 | 58407.83 | 56064.97 | 99 |
| 94930 | 4800 | 3000 | 58388.43 | 56046.47 | 99 |
| 94958 | 4800 | 3012.5 | 58394.33 | 56051.6 | 99 |
| 95022 | 4800 | 3025 | 58395.22 | 56052.13 | 99 |
| 95042.5 | 4800 | 3037.5 | 58393.54 | 56051.58 | 99 |
| 95106 | 4800 | 3050 | 58394.94 | 56053.09 | 99 |
| 95126 | 4800 | 3062.5 | 58395.88 | 56052.39 | 99 |
| 95202 | 4800 | 3075 | 58398.4 | 56053.97 | 99 |
| 95226 | 4800 | 3087.5 | 58398.38 | 56053.26 | 99 |
| 95250 | 4800 | 3100 | 58397.99 | 56054.2 | 99 |
| 95314 | 4800 | 3112.5 | 58396.51 | 56054.04 | 99 |

## Raw Diurnal Corrected Magnetic Data - S5AB
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 95338 | 4800 | 3125 | 58398.01 | 56055.1 | 99 |
| 95402 | 4800 | 3137.5 | 58400.05 | 56054.95 | 99 |
| 95418 | 4800 | 3150 | 58400.87 | 56054.64 | 99 |
| 95438 | 4800 | 3162.5 | 58403.71 | 56055.68 | 99 |
| 95454 | 4800 | 3175 | 58403.41 | 56055.48 | 99 |
| 95514 | 4800 | 3187.5 | 58403.19 | 56055.33 | 99 |
| 95534 | 4800 | 3200 | 58403.3 | 56054.96 | 99 |
| 95554 | 4800 | 3212.5 | 58403.8 | 56055.26 | 99 |
| 95614 | 4800 | 3225 | 58406.93 | 56055.87 | 99 |
| 95634 | 4800 | 3237.5 | 58409.63 | 56056.38 | 99 |
| 95654 | 4800 | 3250 | 58410.05 | 56055.81 | 99 |
| 95858 | 4900 | 3250 | 58415.35 | 56058.73 | 99 |
| 95918 | 4900 | 3237.5 | 58414.48 | 56058.17 | 99 |
| 95942 | 4900 | 3225 | 58413.02 | 56058.26 | 99 |
| 100002 | 4900 | 3212.5 | 58411.5 | 56058.27 | 99 |
| 100030 | 4900 | 3200 | 58410.65 | 56056.53 | 99 |
| 100054 | 4900 | 3187.5 | 58412.05 | 56056.67 | 99 |
| 100114 | 4900 | 3175 | 58414.76 | 56057.82 | 99 |
| 100134 | 4900 | 3162.5 | 58414.6 | 56057.74 | 99 |
| 100158 | 4900 | 3150 | 58413.27 | 56056.65 | 99 |
| 100218 | 4900 | 3137.5 | 58412.61 | 56056.22 | 99 |
| 100238 | 4900 | 3125 | 58412.5 | 56056.43 | 99 |
| 100258 | 4900 | 3112.5 | 58412.37 | 56055.87 | 99 |
| 100318 | 4900 | 3100 | 58412.72 | 56055.64 | 99 |
| 100342 | 4900 | 3087.5 | 58411.19 | 56053.7 | 99 |
| 100402 | 4900 | 3075 | 58411.83 | 56054.24 | 99 |
| 100422 | 4900 | 3062.5 | 58409.22 | 56052.45 | 99 |
| 100458 | 4900 | 3050 | 58406.9 | 56048.15 | 99 |
| 100518 | 4900 | 3037.5 | 58399.31 | 56041.08 | 99 |
| 100538 | 4900 | 3025 | 58384.58 | 56028.19 | 99 |
| 100558 | 4900 | 3012.5 | 58351.76 | 55995.93 | 99 |
| 100618 | 4900 | 3000 | 58316.47 | 55962.61 | 99 |
| 100638 | 4900 | 2987.5 | 58601.65 | 56250.65 | 99 |
| 100714 | 4900 | 2975 | 58296.86 | 55944.71 | 99 |
| 100738 | 4900 | 2962.5 | 58383.68 | 56029.29 | 99 |
| 100802 | 4900 | 2950 | 58385.49 | 56030.48 | 99 |
| 100822 | 4900 | 2937.5 | 58401.46 | 56044.39 | 99 |
| 100846 | 4900 | 2925 | 58410.62 | 56051.6 | 99 |
| 100910 | 4900 | 2912.5 | 58414.34 | 56053.92 | 99 |
| 100930 | 4900 | 2900 | 58416.1 | 56054.64 | 99 |
| 100954 | 4900 | 2887.5 | 58416.72 | 56055.47 | 99 |
| 101014 | 4900 | 2875 | 58413.07 | 56053.06 | 99 |
| 101034 | 4900 | 2862.5 | 58412.71 | 56053.13 | 99 |
| 101058 | 4900 | 2850 | 58412.43 | 56053.94 | 99 |
| 101118 | 4900 | 2837.5 | 58408.16 | 56049.82 | 99 |
| 101142 | 4900 | 2825 | 58412.43 | 56053.54 | 99 |
| 101202 | 4900 | 2812.5 | 58415.39 | 56055.28 | 99 |
| 101226 | 4900 | 2800 | 58416.92 | 56052.7 | 99 |
| 101250 | 4900 | 2787.5 | 58406.17 | 56039.14 | 99 |
| 101314 | 4900 | 2775 | 58372.96 | 56003.65 | 99 |
| 101342 | 4900 | 2762.5 | 58378.98 | 56010.63 | 99 |
| 101410 | 4900 | 2750 | 58414.04 | 56047.42 | 99 |
| 101702 | 4950 | 2750 | 58407.3 | 56038.34 | 99 |
| 101730 | 4950 | 2762.5 | 58410.99 | 56038.1 | 99 |
| 101758 | 4950 | 2775 | 58417.88 | 56041.86 | 99 |
| 101830 | 4950 | 2787.5 | 58429.13 | 56049.01 | 99 |
| 101910 | 4950 | 2800 | 58434.13 | 56052.5 | 99 |
| 101934 | 4950 | 2812.5 | 58435.33 | 56053.31 | 99 |
| 101954 | 4950 | 2825 | 58434.9 | 56051.83 | 99 |
| 102014 | 4950 | 2837.5 | 58433.34 | 56050.8 | 99 |
| 102034 | 4950 | 2850 | 58434.48 | 56051.83 | 99 |
| 102054 | 4950 | 2862.5 | 58432.9 | 56051.4 | 99 |
| 102122 | 4950 | 2875 | 58433.82 | 56051.61 | 99 |
| 102146 | 4950 | 2887.5 | 58435.13 | 56054.06 | 99 |
| 102210 | 4950 | 2900 | 58433.6 | 56051.74 | 99 |
| 102246 | 4950 | 2912.5 | 58435.27 | 56050.21 | 99 |
| 102310 | 4950 | 2925 | 58431.9 | 56047.9 | 99 |
| 102334 | 4950 | 2937.5 | 58423.35 | 56042.27 | 99 |
| 102402 | 4950 | 2950 | 58400.38 | 56026 | 99 |
| 102426 | 4950 | 2962.5 | 58345.95 | 55977.93 | 99 |
| 102446 | 4950 | 2975 | 58199.22 | 55832.95 | 99 |
| 102530 | 4950 | 2987.5 | 59340.86 | 56975.47 | 99 |
| 102558 | 4950 | 3000 | 58578.46 | 56214.77 | 99 |
| 103442 | 4950 | 3012.5 | 58381.37 | 56008.96 | 99 |
| 103506 | 4950 | 3025 | 58343.5 | 55969.48 | 99 |
| 103534 | 4950 | 3037.5 | 58398.2 | 56025.13 | 99 |
| 103558 | 4950 | 3050 | 58416.37 | 56042.39 | 99 |
| 103622 | 4950 | 3062.5 | 58423.72 | 56049.83 | 99 |
| 103642 | 4950 | 3075 | 58427.46 | 56052.96 | 99 |
| 103702 | 4950 | 3087.5 | 58431.71 | 56055 | 99 |
| 103730 | 4950 | 3100 | 58431.4 | 56054.92 | 99 |
| 103758 | 4950 | 3112.5 | 58435.61 | 56057.58 | 99 |
| 103822 | 4950 | 3125 | 58439.05 | 56058.24 | 99 |
| 103842 | 4950 | 3137.5 | 58441.89 | 56057.82 | 99 |
| 103902 | 4950 | 3150 | 58445.72 | 56058.35 | 99 |
| 103926 | 4950 | 3162.5 | 58448.16 | 56058.9 | 99 |
| 103954 | 4950 | 3175 | 58448.52 | 56057.07 | 99 |
| 104018 | 4950 | 3187.5 | 58449.43 | 56057.88 | 99 |

## Raw Diurnal Corrected Magnetic Data - S5AB
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 104042 | 4950 | 3200 | 58451.53 | 56058.29 | 99 |
| 104106 | 4950 | 3212.5 | 58451.58 | 56058.19 | 99 |
| 104130 | 4950 | 3225 | 58451.2 | 56059.02 | 99 |
| 104154 | 4950 | 3237.5 | 58446.26 | 56058.9 | 99 |
| 104218 | 4950 | 3250 | 58441.36 | 56058.68 | 99 |
| 104322 | 5000 | 3250 | 58441.04 | 56060.25 | 99 |
| 104342 | 5000 | 3237.5 | 58441.57 | 56059.31 | 99 |
| 104410 | 5000 | 3225 | 58444.59 | 56060.33 | 99 |
| 104442 | 5000 | 3212.5 | 58443.49 | 56059.27 | 99 |
| 104506 | 5000 | 3200 | 58444.9 | 56060.48 | 99 |
| 104530 | 5000 | 3187.5 | 58444.26 | 56058.84 | 99 |
| 104558 | 5000 | 3175 | 58441.88 | 56057.67 | 99 |
| 104626.8 | 5000 | 3162.5 | 58444 | 56060.02 | 99 |
| 104646 | 5000 | 3150 | 58443.9 | 56059.04 | 99 |
| 104710 | 5000 | 3137.5 | 58446.17 | 56059.28 | 99 |
| 104734 | 5000 | 3125 | 58445.65 | 56058.36 | 99 |
| 104754 | 5000 | 3112.5 | 58444.45 | 56057.54 | 99 |
| 104826 | 5000 | 3100 | 58445.34 | 56059.02 | 99 |
| 104846 | 5000 | 3087.5 | 58442.74 | 56059.26 | 99 |
| 104918 | 5000 | 3075 | 58435.76 | 56056.67 | 99 |
| 104942 | 5000 | 3062.5 | 58435.26 | 56056.25 | 99 |
| 105002 | 5000 | 3050 | 58430.25 | 56051.83 | 99 |
| 105022 | 5000 | 3037.5 | 58431.65 | 56052.72 | 99 |
| 105050 | 5000 | 3025 | 58430.44 | 56050.72 | 99 |
| 105114 | 5000 | 3012.5 | 58459.52 | 56075.31 | 99 |
| 105146 | 5000 | 3000 | 58426.33 | 56036.73 | 99 |
| 105214 | 5000 | 2987.5 | 58435.86 | 56042.2 | 99 |
| 105242 | 5000 | 2975 | 58439.05 | 56043.45 | 99 |
| 105306 | 5000 | 2962.5 | 58438.42 | 56041.85 | 99 |
| 105326 | 5000 | 2950 | 58441.33 | 56044.48 | 99 |
| 105350 | 5000 | 2937.5 | 58448.09 | 56049.79 | 99 |
| 105410 | 5000 | 2925 | 58451 | 56051.45 | 99 |
| 105434 | 5000 | 2912.5 | 58453.06 | 56052.52 | 99 |
| 105458 | 5000 | 2900 | 58452.39 | 56053.31 | 99 |
| 105518 | 5000 | 2887.5 | 58453.03 | 56053.43 | 99 |
| 105542 | 5000 | 2875 | 58458.27 | 56061.14 | 99 |
| 105606 | 5000 | 2862.5 | 58452.93 | 56054.57 | 99 |
| 105626 | 5000 | 2850 | 58449.21 | 56052.52 | 99 |
| 105654 | 5000 | 2837.5 | 58449.23 | 56052.66 | 99 |
| 105714 | 5000 | 2825 | 58452.15 | 56054.32 | 99 |
| 105734 | 5000 | 2812.5 | 58452.25 | 56054.99 | 99 |
| 105754 | 5000 | 2800 | 58447.96 | 56054.27 | 99 |
| 105818 | 5000 | 2787.5 | 58442.83 | 56054.95 | 99 |
| 105842 | 5000 | 2775 | 58441.26 | 56055.93 | 99 |
| 105914 | 5000 | 2762.5 | 58437.42 | 56052.16 | 99 |
| 105954 | 5000 | 2750 | 58445.05 | 56053.74 | 99 |
| 110026 | 5000 | 2737.5 | 58437.56 | 56048.48 | 99 |
| 110058 | 5000 | 2725 | 58435.75 | 56050.15 | 99 |
| 110134 | 5000 | 2712.5 | 58426.67 | 56054.81 | 99 |
| 110158 | 5000 | 2700 | 58420.32 | 56054.74 | 99 |
| 110222 | 5000 | 2687.5 | 58418.77 | 56054.97 | 99 |
| 110246 | 5000 | 2675 | 58418.62 | 56053.72 | 99 |
| 110318 | 5000 | 2662.5 | 58425.04 | 56054.37 | 99 |
| 110354 | 5000 | 2650 | 58428.1 | 56052.47 | 99 |
| 110426 | 5000 | 2637.5 | 58424.19 | 56052.98 | 99 |
| 110446 | 5000 | 2625 | 58422.84 | 56056.59 | 99 |
| 110522 | 5000 | 2612.5 | 58414.33 | 56053.14 | 99 |
| 110558 | 5000 | 2600 | 58415.85 | 56055.7 | 99 |
| 110626 | 5000 | 2587.5 | 58415.11 | 56053.4 | 99 |
| 110646 | 5000 | 2575 | 58413.72 | 56049.42 | 99 |
| 110710 | 5000 | 2562.5 | 58423.27 | 56055.19 | 99 |
| 110730 | 5000 | 2550 | 58420.36 | 56051.48 | 99 |
| 110754 | 5000 | 2537.5 | 58419.39 | 56052.23 | 99 |
| 110818.9 | 5000 | 2525 | 58415.47 | 56051.84 | 99 |
| 110842 | 5000 | 2512.5 | 58413.52 | 56052.5 | 99 |
| 110902 | 5000 | 2500 | 58411.75 | 56052.25 | 99 |
| 110922 | 5000 | 2487.5 | 58412.24 | 56052.11 | 99 |
| 110942 | 5000 | 2475 | 58412.51 | 56051.09 | 99 |
| 111006 | 5000 | 2462.5 | 58412.86 | 56051.17 | 99 |
| 111030 | 5000 | 2450 | 58416.17 | 56052.51 | 99 |
| 111050 | 5000 | 2437.5 | 58413.31 | 56048.43 | 99 |
| 111110 | 5000 | 2425 | 58416.16 | 56049.86 | 99 |
| 111130 | 5000 | 2412.5 | 58419.36 | 56052.48 | 99 |
| 111150 | 5000 | 2400 | 58418.97 | 56051.82 | 99 |
| 111454 | 5100 | 2400 | 58414.52 | 56051.78 | 99 |
| 111526 | 5100 | 2412.5 | 58420.52 | 56056.07 | 99 |
| 111546 | 5100 | 2425 | 58416.15 | 56052.36 | 99 |
| 111606 | 5100 | 2437.5 | 58415.11 | 56051.86 | 99 |
| 111626 | 5100 | 2450 | 58418.12 | 56054.31 | 99 |
| 111646 | 5100 | 2462.5 | 58416.49 | 56052.14 | 99 |
| 111710 | 5100 | 2475 | 58420.07 | 56052.98 | 99 |
| 111734 | 5100 | 2487.5 | 58421.32 | 56051.38 | 99 |
| 111754 | 5100 | 2500 | 58422.82 | 56052.57 | 99 |
| 111822 | 5100 | 2512.5 | 58422.54 | 56052.22 | 99 |
| 111858 | 5100 | 2525 | 58420.89 | 56053.2 | 99 |
| 111922 | 5100 | 2537.5 | 58419.72 | 56053.64 | 99 |
| 111942 | 5100 | 2550 | 58417.74 | 56051.83 | 99 |
| 112006 | 5100 | 2562.5 | 58418.77 | 56053.45 | 99 |

## Raw Diurnal Corrected Magnetic Data - S5AB
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 112026 | 5100 | 2575 | 58418.22 | 56053.38 | 99 |
| 112050 | 5100 | 2587.5 | 58416.7 | 56053.2 | 99 |
| 112110 | 5100 | 2600 | 58416.63 | 56054.26 | 99 |
| 112138 | 5100 | 2612.5 | 58418.55 | 56054.9 | 99 |
| 112158 | 5100 | 2625 | 58421.5 | 56054.66 | 99 |
| 112222 | 5100 | 2637.5 | 58424.03 | 56053.98 | 99 |
| 112258 | 5100 | 2650 | 58427.44 | 56055.36 | 99 |
| 112322 | 5100 | 2662.5 | 58424.9 | 56054.41 | 99 |
| 112342 | 5100 | 2675 | 58420.01 | 56052.35 | 99 |
| 112402 | 5100 | 2687.5 | 58416.57 | 56050.37 | 99 |
| 112430 | 5100 | 2700 | 58418.21 | 56052.33 | 99 |
| 112454 | 5100 | 2712.5 | 58420.83 | 56054.6 | 99 |
| 112514 | 5100 | 2725 | 58419.98 | 56053.66 | 99 |
| 112538 | 5100 | 2737.5 | 58420.75 | 56053.97 | 99 |
| 112606 | 5100 | 2750 | 58421.06 | 56054.8 | 99 |
| 112630 | 5100 | 2762.5 | 58419.99 | 56054.09 | 99 |
| 112706 | 5100 | 2775 | 58419.97 | 56053.57 | 99 |
| 112826 | 5100 | 2787.5 | 58420.48 | 56056.58 | 99 |
| 112858 | 5100 | 2800 | 58421.84 | 56056.72 | 99 |
| 112922 | 5100 | 2812.5 | 58420.4 | 56054.26 | 99 |
| 112942 | 5100 | 2825 | 58419.82 | 56052.71 | 99 |
| 113002 | 5100 | 2837.5 | 58424.31 | 56056.59 | 99 |
| 113022 | 5100 | 2850 | 58427.88 | 56060.11 | 99 |
| 113050 | 5100 | 2862.5 | 58425.74 | 56057.64 | 99 |
| 113106 | 5100 | 2875 | 58432.12 | 56063.62 | 99 |
| 113130 | 5100 | 2887.5 | 58429.12 | 56060.38 | 99 |
| 113154 | 5100 | 2900 | 58428.34 | 56059.63 | 99 |
| 113214 | 5100 | 2912.5 | 58418.51 | 56050.53 | 99 |
| 113234 | 5100 | 2925 | 58413.65 | 56046.07 | 99 |
| 113258 | 5100 | 2937.5 | 58417.77 | 56050.12 | 99 |
| 113322 | 5100 | 2950 | 58421.74 | 56052.8 | 99 |
| 113346 | 5100 | 2962.5 | 58425.09 | 56054.18 | 99 |
| 113402 | 5100 | 2975 | 58426.49 | 56054.15 | 99 |
| 113422 | 5100 | 2987.5 | 58426.73 | 56053.53 | 99 |
| 113450 | 5100 | 3000 | 58429.76 | 56055.54 | 99 |
| 113522 | 5100 | 3012.5 | 58431.98 | 56056.58 | 99 |
| 113546 | 5100 | 3025 | 58433.78 | 56056.71 | 99 |
| 113610 | 5100 | 3037.5 | 58435.9 | 56058.45 | 99 |
| 113634 | 5100 | 3050 | 58435.78 | 56059.07 | 99 |
| 113702 | 5100 | 3062.5 | 58434.98 | 56059.44 | 99 |
| 113722 | 5100 | 3075 | 58432.77 | 56059.07 | 99 |
| 113746 | 5100 | 3087.5 | 58430.74 | 56058.47 | 99 |
| 113814 | 5100 | 3100 | 58428.89 | 56058.42 | 99 |
| 113838 | 5100 | 3112.5 | 58428.27 | 56058.01 | 99 |
| 113902 | 5100 | 3125 | 58430.5 | 56059.24 | 99 |
| 113922 | 5100 | 3137.5 | 58432.05 | 56059.06 | 99 |
| 113946 | 5100 | 3150 | 58434.84 | 56059.96 | 99 |
| 114006 | 5100 | 3162.5 | 58435.2 | 56059.6 | 99 |
| 114030 | 5100 | 3175 | 58435.35 | 56059.77 | 99 |
| 114054 | 5100 | 3187.5 | 58434.38 | 56060.06 | 99 |
| 114118 | 5100 | 3200 | 58434.12 | 56060.91 | 99 |
| 114146 | 5100 | 3212.5 | 58432.08 | 56060.71 | 99 |
| 114218 | 5100 | 3225 | 58430.94 | 56061.22 | 99 |
| 114238 | 5100 | 3237.5 | 58428.53 | 56060.26 | 99 |
| 114302 | 5100 | 3250 | 58427.97 | 56061.55 | 99 |
| 114638 | 5200 | 3250 | 58433.29 | 56061.86 | 99 |
| 114702.6 | 5200 | 3237.5 | 58432.28 | 56061.55 | 99 |
| 114738 | 5200 | 3225 | 58433.88 | 56063.42 | 99 |
| 114810 | 5200 | 3212.5 | 58433.93 | 56063.19 | 99 |
| 114830 | 5200 | 3200 | 58434.41 | 56063.04 | 99 |
| 114850 | 5200 | 3187.5 | 58434.96 | 56062.59 | 99 |
| 114906 | 5200 | 3175 | 58433.87 | 56061.16 | 99 |
| 114922.3 | 5200 | 3162.5 | 58433.78 | 56061.36 | 99 |
| 114954 | 5200 | 3150 | 58428.22 | 56054.63 | 99 |
| 115018 | 5200 | 3137.5 | 58436.35 | 56063.85 | 99 |
| 115046 | 5200 | 3125 | 58436.33 | 56064.75 | 99 |
| 115110 | 5200 | 3112.5 | 58432.24 | 56060.24 | 99 |
| 115134.8 | 5200 | 3100 | 58433.14 | 56060.95 | 99 |
| 115154 | 5200 | 3087.5 | 58432.88 | 56061.49 | 99 |
| 115214 | 5200 | 3075 | 58434.49 | 56063.67 | 99 |
| 115238 | 5200 | 3062.5 | 58431.57 | 56060.61 | 99 |
| 115302 | 5200 | 3050 | 58431.97 | 56061.42 | 99 |
| 115330 | 5200 | 3037.5 | 58431.13 | 56060.92 | 99 |
| 115346 | 5200 | 3025 | 58428.89 | 56058.39 | 99 |
| 115406 | 5200 | 3012.5 | 58429.21 | 56058.38 | 99 |
| 115426 | 5200 | 3000 | 58427.07 | 56056.47 | 99 |
| 115446 | 5200 | 2987.5 | 58425.54 | 56055.29 | 99 |
| 115506 | 5200 | 2975 | 58429.56 | 56059.93 | 99 |
| 115522 | 5200 | 2962.5 | 58426.87 | 56057.33 | 99 |
| 115538 | 5200 | 2950 | 58431.92 | 56061.55 | 99 |
| 115558 | 5200 | 2937.5 | 58428.83 | 56058.8 | 99 |
| 115622 | 5200 | 2925 | 58427.02 | 56058.15 | 99 |
| 115646 | 5200 | 2912.5 | 58427.94 | 56060.22 | 99 |
| 115714 | 5200 | 2900 | 58422.06 | 56056.9 | 99 |
| 115742 | 5200 | 2887.5 | 58420.79 | 56056.39 | 99 |
| 115806 | 5200 | 2875 | 58422.39 | 56058.1 | 99 |
| 115830 | 5200 | 2862.5 | 58421.79 | 56056.58 | 99 |
| 115858 | 5200 | 2850 | 58422.99 | 56057.25 | 99 |

## Raw Diurnal Corrected Magnetic Data - S5AB
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 115922 | 5200 | 2837.5 | 58420.15 | 56054.81 | 99 |
| 115958 | 5200 | 2825 | 58417.87 | 56052.43 | 99 |
| 120326 | 5200 | 2812.5 | 58388.97 | 56019.28 | 99 |
| 120438 | 5200 | 2800 | 58198.11 | 55828 | 99 |
| 120522 | 5200 | 2787.5 | 58161.49 | 55793.62 | 99 |
| 120546 | 5200 | 2775 | 58198.14 | 55833.3 | 99 |
| 120642 | 5200 | 2762.5 | 58197.78 | 55835.21 | 99 |
| 120658 | 5200 | 2750 | 58212.16 | 55849.17 | 99 |
| 120714 | 5200 | 2737.5 | 58199.86 | 55836.91 | 99 |
| 120738 | 5200 | 2725 | 58297.41 | 55934.88 | 99 |
| 120802 | 5200 | 2712.5 | 58356.8 | 55993.57 | 99 |
| 120842 | 5200 | 2700 | 58966.99 | 56604.54 | 99 |
| 120910 | 5200 | 2687.5 | 58446.36 | 56085.96 | 99 |
| 120938 | 5200 | 2675 | 58407.84 | 56049.71 | 99 |
| 120954.9 | 5200 | 2662.5 | 58409.42 | 56051.06 | 99 |
| 121030 | 5200 | 2650 | 58411.56 | 56051.65 | 99 |
| 121950 | 5200 | 2637.5 | 58420.04 | 56054.94 | 99 |
| 122018 | 5200 | 2625 | 58419.26 | 56055.09 | 99 |
| 122046 | 5200 | 2612.5 | 58421.5 | 56055.8 | 99 |
| 122118 | 5200 | 2600 | 58419.69 | 56055.22 | 99 |
| 122142 | 5200 | 2587.5 | 58419.18 | 56055.62 | 99 |
| 122202 | 5200 | 2575 | 58417.58 | 56053.84 | 99 |
| 122230 | 5200 | 2562.5 | 58418.44 | 56055.41 | 99 |
| 122302 | 5200 | 2550 | 58414.78 | 56053.8 | 99 |
| 122330 | 5200 | 2537.5 | 58415.06 | 56054.75 | 99 |
| 122402.4 | 5200 | 2525 | 58411.45 | 56052.91 | 99 |
| 122434 | 5200 | 2512.5 | 58412.43 | 56055.62 | 99 |
| 122502 | 5200 | 2500 | 58410.22 | 56054.83 | 99 |
| 122526 | 5200 | 2487.5 | 58411.71 | 56054.53 | 99 |
| 122554 | 5200 | 2475 | 58414.83 | 56054.02 | 99 |
| 122614 | 5200 | 2462.5 | 58416.23 | 56053.19 | 99 |
| 122638.7 | 5200 | 2450 | 58416.87 | 56052.59 | 99 |
| 122702 | 5200 | 2437.5 | 58415.11 | 56050.17 | 99 |
| 122726 | 5200 | 2425 | 58427.05 | 56060.75 | 99 |
| 122750 | 5200 | 2412.5 | 58423.32 | 56057.29 | 99 |
| 122826 | 5200 | 2400 | 58415.88 | 56050.13 | 99 |
| 124238 | 5250 | 2400 | 58412.18 | 56053.93 | 99 |
| 124258 | 5250 | 2412.5 | 58412.71 | 56053.46 | 99 |
| 124322 | 5250 | 2425 | 58413.42 | 56053.23 | 99 |
| 124342 | 5250 | 2437.5 | 58415 | 56054.06 | 99 |
| 124406 | 5250 | 2450 | 58413.48 | 56051.8 | 99 |
| 124430 | 5250 | 2462.5 | 58415.52 | 56052.64 | 99 |
| 124450 | 5250 | 2475 | 58416.98 | 56053.58 | 99 |
| 124510 | 5250 | 2487.5 | 58418.69 | 56054.43 | 99 |
| 124534 | 5250 | 2500 | 58420.09 | 56054.22 | 99 |
| 124558 | 5250 | 2512.5 | 58421.14 | 56053.47 | 99 |
| 124622 | 5250 | 2525 | 58423.94 | 56055.21 | 99 |
| 124646 | 5250 | 2537.5 | 58423.98 | 56055.04 | 99 |
| 124710 | 5250 | 2550 | 58423.29 | 56055.11 | 99 |
| 124734 | 5250 | 2562.5 | 58422.22 | 56054.68 | 99 |
| 124758 | 5250 | 2575 | 58423.91 | 56055.24 | 99 |
| 124826 | 5250 | 2587.5 | 58426.05 | 56055.65 | 99 |
| 124858 | 5250 | 2600 | 58428.87 | 56057.28 | 99 |
| 124918 | 5250 | 2612.5 | 58428.36 | 56057.67 | 99 |
| 124942 | 5250 | 2625 | 58424 | 56053.95 | 99 |
| 125006 | 5250 | 2637.5 | 58423.77 | 56054.12 | 99 |
| 125030 | 5250 | 2650 | 58420.48 | 56051.83 | 99 |
| 125102 | 5250 | 2662.5 | 58418.77 | 56051.56 | 99 |
| 125126 | 5250 | 2675 | 58416.13 | 56048.42 | 99 |
| 125158 | 5250 | 2687.5 | 58417.84 | 56049.05 | 99 |
| 125230 | 5250 | 2700 | 58414.96 | 56045.74 | 99 |
| 125302 | 5250 | 2712.5 | 58412.05 | 56042.07 | 99 |
| 125326 | 5250 | 2725 | 58395.75 | 56025.18 | 99 |
| 125402 | 5250 | 2737.5 | 58381.31 | 56010.38 | 99 |
| 125422 | 5250 | 2750 | 58372.77 | 56002.26 | 99 |
| 125446 | 5250 | 2762.5 | 58370.5 | 55999.54 | 99 |
| 125510 | 5250 | 2775 | 58360.38 | 55991.35 | 99 |
| 125538 | 5250 | 2787.5 | 58374.38 | 56006.36 | 99 |
| 125606 | 5250 | 2800 | 58389.72 | 56024.11 | 99 |
| 125630 | 5250 | 2812.5 | 58407 | 56043.01 | 99 |
| 125654 | 5250 | 2825 | 58412.11 | 56050.11 | 99 |
| 125718 | 5250 | 2837.5 | 58415.27 | 56054.11 | 99 |
| 125754 | 5250 | 2850 | 58414.21 | 56054.34 | 99 |
| 125822 | 5250 | 2862.5 | 58414.74 | 56054.68 | 99 |
| 125846 | 5250 | 2875 | 58416.39 | 56056.3 | 99 |
| 133810 | 5300 | 2900 | 58424.46 | 56061.7 | 99 |
| 133834 | 5300 | 2887.5 | 58427.41 | 56064.63 | 99 |
| 133854 | 5300 | 2875 | 58420.35 | 56058.47 | 99 |
| 133914 | 5300 | 2862.5 | 58416.5 | 56055.16 | 99 |
| 133938 | 5300 | 2850 | 58417.46 | 56057.06 | 99 |
| 133958 | 5300 | 2837.5 | 58414.35 | 56054.71 | 99 |
| 134014 | 5300 | 2825 | 58414.97 | 56055.42 | 99 |
| 134034.3 | 5300 | 2812.5 | 58415.11 | 56055.36 | 99 |
| 134058 | 5300 | 2800 | 58415.28 | 56054.82 | 99 |
| 134122 | 5300 | 2787.5 | 58415.62 | 56053.74 | 99 |
| 134150 | 5300 | 2775 | 58417.56 | 56053.24 | 99 |
| 134222 | 5300 | 2762.5 | 58417.36 | 56052.61 | 99 |
| 134246 | 5300 | 2750 | 58418.89 | 56054.01 | 99 |

## Raw Diurnal Corrected Magnetic Data - S5AB
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 134314 | 5300 | 2737.5 | 58417.66 | 56053.72 | 99 |
| 134334 | 5300 | 2725 | 58419.95 | 56056.12 | 99 |
| 134358 | 5300 | 2712.5 | 58418.28 | 56054.67 | 99 |
| 134426 | 5300 | 2700 | 58425.1 | 56062.05 | 99 |
| 134450.9 | 5300 | 2687.5 | 58423.2 | 56060.94 | 99 |
| 134514 | 5300 | 2675 | 58418.15 | 56055.19 | 99 |
| 134538 | 5300 | 2662.5 | 58422.29 | 56059.34 | 99 |
| 134606 | 5300 | 2650 | 58419.52 | 56055.72 | 99 |
| 141054 | 5300 | 2637.5 | 58423.55 | 56057.21 | 99 |
| 141114 | 5300 | 2625 | 58422.99 | 56056.53 | 99 |
| 141134 | 5300 | 2612.5 | 58421.09 | 56054.78 | 99 |
| 141158 | 5300 | 2600 | 58422.61 | 56056.23 | 99 |
| 141218 | 5300 | 2587.5 | 58421.27 | 56054.52 | 99 |
| 141250 | 5300 | 2575 | 58420.91 | 56054.1 | 99 |
| 141318 | 5300 | 2562.5 | 58424.38 | 56057.17 | 99 |
| 141342 | 5300 | 2550 | 58426.13 | 56058.35 | 99 |
| 141402 | 5300 | 2537.5 | 58426.98 | 56058.64 | 99 |
| 141422 | 5300 | 2525 | 58425.32 | 56056.62 | 99 |
| 141446 | 5300 | 2512.5 | 58423.39 | 56054.44 | 99 |
| 141514 | 5300 | 2500 | 58424.84 | 56055.54 | 99 |
| 141534 | 5300 | 2487.5 | 58423.94 | 56054.33 | 99 |
| 141558 | 5300 | 2475 | 58426.67 | 56056.03 | 99 |
| 141622 | 5300 | 2462.5 | 58425.08 | 56053.77 | 99 |
| 141646 | 5300 | 2450 | 58426.55 | 56054.96 | 99 |
| 141714 | 5300 | 2437.5 | 58425.49 | 56053.62 | 99 |
| 141742 | 5300 | 2425 | 58424.79 | 56053.73 | 99 |
| 141802 | 5300 | 2412.5 | 58425.18 | 56054.47 | 99 |
| 141826 | 5300 | 2400 | 58424.06 | 56053.29 | 99 |
| 144226 | 5400 | 2400 | 58432.06 | 56055.92 | 99 |
| 144254 | 5400 | 2412.5 | 58435.02 | 56058.51 | 99 |
| 144318 | 5400 | 2425 | 58435.07 | 56057.71 | 99 |
| 144334 | 5400 | 2437.5 | 58433.86 | 56055.94 | 99 |
| 144354 | 5400 | 2450 | 58432.88 | 56054.22 | 99 |
| 144418 | 5400 | 2462.5 | 58436.82 | 56057.1 | 99 |
| 144442 | 5400 | 2475 | 58436 | 56055.12 | 99 |
| 144534 | 5400 | 2487.5 | 58439.21 | 56057.78 | 99 |
| 144554 | 5400 | 2500 | 58438.27 | 56056.26 | 99 |
| 144622 | 5400 | 2512.5 | 58438.92 | 56056.15 | 99 |
| 144646 | 5400 | 2525 | 58439.59 | 56057.09 | 99 |
| 144710 | 5400 | 2537.5 | 58440.99 | 56059.2 | 99 |
| 144734 | 5400 | 2550 | 58438.09 | 56056.81 | 99 |
| 144754 | 5400 | 2562.5 | 58438.07 | 56057.02 | 99 |
| 144822 | 5400 | 2575 | 58437.75 | 56056.42 | 99 |
| 144842 | 5400 | 2587.5 | 58439.55 | 56057.76 | 99 |
| 144906 | 5400 | 2600 | 58440.22 | 56057.6 | 99 |
| 144938 | 5400 | 2612.5 | 58440.25 | 56057.19 | 99 |
| 145006 | 5400 | 2625 | 58439.67 | 56057.34 | 99 |
| 145038 | 5400 | 2637.5 | 58441.39 | 56060.72 | 99 |
| 145106 | 5400 | 2650 | 58437.45 | 56057.67 | 99 |
| 145130 | 5400 | 2662.5 | 58437.91 | 56058.08 | 99 |
| 145150 | 5400 | 2675 | 58438.71 | 56058.89 | 99 |
| 145214 | 5400 | 2687.5 | 58437.07 | 56057.45 | 99 |
| 145242 | 5400 | 2700 | 58439.18 | 56059.7 | 99 |
| 145306 | 5400 | 2712.5 | 58440.87 | 56061.36 | 99 |
| 145330 | 5400 | 2725 | 58440.02 | 56060.14 | 99 |
| 145358 | 5400 | 2737.5 | 58437.21 | 56057.81 | 99 |
| 145430 | 5400 | 2750 | 58437.48 | 56060.27 | 99 |
| 145502 | 5400 | 2762.5 | 58434.54 | 56058.6 | 99 |
| 145526 | 5400 | 2775 | 58435.25 | 56060.58 | 99 |
| 145550 | 5400 | 2787.5 | 58432.72 | 56058.59 | 99 |
| 145618 | 5400 | 2800 | 58434.73 | 56059.82 | 99 |
| 145643 | 5400 | 2812.5 | 58435.15 | 56057.86 | 99 |
| 145710 | 5400 | 2825 | 58440.11 | 56059.24 | 99 |
| 145734 | 5400 | 2837.5 | 58442.85 | 56059.58 | 99 |
| 145758 | 5400 | 2850 | 58443.84 | 56059.69 | 99 |
| 134934 | 5400 | 2650 | 58418.95 | 56059 | 99 |
| 135026 | 5375 | 2650 | 58419.13 | 56060.97 | 99 |
| 135102 | 5350 | 2650 | 58419.33 | 56060.8 | 99 |
| 135154 | 5325 | 2650 | 58414.7 | 56056.21 | 99 |
| 135230 | 5300 | 2650 | 58416.68 | 56059.14 | 99 |
| 135314 | 5275 | 2650 | 58416.82 | 56058.25 | 99 |
| 135430 | 5250 | 2650 | 58413.33 | 56053.59 | 99 |
| 135514 | 5225 | 2650 | 58412.61 | 56054.34 | 99 |
| 135554 | 5200 | 2650 | 58408.84 | 56050.78 | 99 |
| 135634 | 5175 | 2650 | 58411.66 | 56055.58 | 99 |
| 135726 | 5150 | 2650 | 58413.17 | 56055.36 | 99 |
| 135810 | 5125 | 2650 | 58414.96 | 56054.89 | 99 |
| 135902 | 5100 | 2650 | 58419.41 | 56056.06 | 99 |
| 135950 | 5075 | 2650 | 58420.34 | 56055.35 | 99 |
| 140038 | 5050 | 2650 | 58421.19 | 56055.49 | 99 |
| 140118 | 5025 | 2650 | 58419.52 | 56053.44 | 99 |
| 140158 | 5000 | 2650 | 58420.68 | 56053.91 | 99 |

## Raw Diurnal Corrected Magnetic Data - CS6-7
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 111522 | 3225 | 6225 | 58691.79 | 56011.84 | 99 |
| 111546 | 3225 | 6212.5 | 58686.81 | 56006.97 | 99 |
| 111606 | 3225 | 6200 | 58700.74 | 56020.72 | 99 |
| 111630 | 3225 | 6187.5 | 58686.27 | 56006.26 | 99 |
| 111654 | 3225 | 6175 | 58684.29 | 56004.39 | 99 |
| 111726 | 3225 | 6162.5 | 58682.57 | 56002.94 | 99 |
| 111746 | 3225 | 6150 | 58689.59 | 56010.47 | 99 |
| 111814 | 3225 | 6137.5 | 58684.68 | 56005.43 | 99 |
| 111834 | 3225 | 6125 | 58684.4 | 56004.89 | 99 |
| 111858 | 3225 | 6112.5 | 58704.04 | 56024.39 | 99 |
| 111926 | 3225 | 6100 | 58698.9 | 56019.68 | 99 |
| 111954 | 3225 | 6087.5 | 58690.55 | 56010.63 | 99 |
| 112014 | 3225 | 6075 | 58682.49 | 56002.49 | 99 |
| 112042 | 3225 | 6062.5 | 58691.13 | 56010.87 | 99 |
| 112106 | 3225 | 6050 | 58704.55 | 56024.66 | 99 |
| 112146 | 3225 | 6037.5 | 58685.47 | 56005.23 | 99 |
| 112202 | 3225 | 6025 | 58683.23 | 56003.33 | 99 |
| 112234 | 3225 | 6012.5 | 58690.92 | 56011.26 | 99 |
| 112254 | 3225 | 6000 | 58679.59 | 56000.04 | 99 |
| 112322 | 3225 | 5987.5 | 58686.86 | 56007.57 | 99 |
| 112354 | 3225 | 5975 | 58687.02 | 56008.03 | 99 |
| 112422.2 | 3225 | 5962.5 | 58685.98 | 56006.34 | 99 |
| 112442 | 3225 | 5950 | 58686.02 | 56006.11 | 99 |
| 112614 | 3225 | 5937.5 | 58683.75 | 56004.66 | 99 |
| 112630.8 | 3225 | 5925 | 58688.93 | 56009.75 | 99 |
| 112658 | 3225 | 5912.5 | 58697.34 | 56018.02 | 99 |
| 112718 | 3225 | 5900 | 58687.7 | 56007.96 | 99 |
| 112746.6 | 3225 | 5887.5 | 58677.9 | 55997.7 | 99 |
| 112806 | 3225 | 5875 | 58684.44 | 56003.61 | 99 |
| 112842 | 3225 | 5862.5 | 58682.51 | 56001.35 | 99 |
| 112906 | 3225 | 5850 | 58686.53 | 56005.22 | 99 |
| 112938 | 3225 | 5837.5 | 58682.43 | 55999.98 | 99 |
| 112958 | 3225 | 5825 | 58685.09 | 56002.46 | 99 |
| 113030 | 3225 | 5812.5 | 58685.15 | 56002.44 | 99 |
| 113046 | 3225 | 5800 | 58684.27 | 56001.97 | 99 |
| 113158 | 3225 | 5787.5 | 58694.97 | 56013.6 | 99 |
| 113214 | 3225 | 5775 | 58683.8 | 56003.45 | 99 |
| 113246 | 3225 | 5762.5 | 58686.84 | 56007.74 | 99 |
| 113306 | 3225 | 5750 | 58691.87 | 56012.82 | 99 |
| 113342 | 3225 | 5737.5 | 58703.6 | 56025.06 | 99 |
| 113402 | 3225 | 5725 | 58680.06 | 56002.37 | 99 |
| 113430 | 3225 | 5712.5 | 58691.68 | 56013.87 | 99 |
| 113450 | 3225 | 5700 | 58670.62 | 55991.97 | 99 |
| 113518 | 3225 | 5687.5 | 58670.84 | 55990.23 | 99 |
| 113538 | 3225 | 5675 | 58676.57 | 55995.05 | 99 |
| 113602 | 3225 | 5662.5 | 58675.11 | 55993 | 99 |
| 113634 | 3225 | 5650 | 58686.9 | 56005.21 | 99 |
| 113658 | 3225 | 5637.5 | 58673.42 | 55992.29 | 99 |
| 113722 | 3225 | 5625 | 58680.96 | 56000.33 | 99 |
| 113918 | 3275 | 5625 | 58666.68 | 55987.75 | 99 |
| 113938 | 3275 | 5637.5 | 58668.79 | 55989.25 | 99 |
| 113954 | 3275 | 5650 | 58671.36 | 55991.43 | 99 |
| 114018 | 3275 | 5662.5 | 58676.61 | 55996.21 | 99 |
| 114042 | 3275 | 5675 | 58667.89 | 55987.18 | 99 |
| 114110 | 3275 | 5687.5 | 58672.03 | 55991.39 | 99 |
| 114130 | 3275 | 5700 | 58670.5 | 55990.22 | 99 |
| 114158 | 3275 | 5712.5 | 58675.02 | 55995.51 | 99 |
| 114214 | 3275 | 5725 | 58677.42 | 55998.12 | 99 |
| 114238 | 3275 | 5737.5 | 58676.63 | 55997.77 | 99 |
| 114258 | 3275 | 5750 | 58683.77 | 56005.29 | 99 |
| 114326 | 3275 | 5762.5 | 58675.64 | 55997.26 | 99 |
| 114346 | 3275 | 5775 | 58684.19 | 56005.49 | 99 |
| 114410 | 3275 | 5787.5 | 58676.02 | 55996.82 | 99 |
| 114438 | 3275 | 5800 | 58677.34 | 55997.8 | 99 |
| 114506 | 3275 | 5812.5 | 58677.32 | 55997.35 | 99 |
| 114530 | 3275 | 5825 | 58683.52 | 56003.3 | 99 |
| 114554 | 3275 | 5837.5 | 58677.2 | 55997.04 | 99 |
| 114614 | 3275 | 5850 | 58680.9 | 56001.2 | 99 |
| 114642 | 3275 | 5862.5 | 58681.54 | 56002.23 | 99 |
| 114710 | 3275 | 5875 | 58675.91 | 55996.59 | 99 |
| 114738 | 3275 | 5887.5 | 58681.19 | 56001.65 | 99 |
| 114758 | 3275 | 5900 | 58695.73 | 56016.22 | 99 |
| 114902 | 3275 | 5912.5 | 58675.54 | 55996.85 | 99 |
| 114926 | 3275 | 5925 | 58685.25 | 56006.77 | 99 |
| 114954 | 3275 | 5937.5 | 58690.02 | 56011.75 | 99 |
| 115022 | 3275 | 5950 | 58676.39 | 55998.1 | 99 |
| 115046 | 3275 | 5962.5 | 58677.58 | 55999.37 | 99 |
| 115106 | 3275 | 5975 | 58684.6 | 56006.15 | 99 |
| 115146 | 3275 | 5987.5 | 58686.91 | 56007.97 | 99 |
| 115218 | 3275 | 6000 | 58685.53 | 56005.96 | 99 |
| 115254 | 3275 | 6012.5 | 58688.8 | 56008.48 | 99 |
| 115314 | 3275 | 6025 | 58673.65 | 55993.36 | 99 |
| 115338 | 3275 | 6037.5 | 58679.56 | 55999.44 | 99 |
| 115358 | 3275 | 6050 | 58663.77 | 55983.58 | 99 |
| 115430 | 3275 | 6062.5 | 58673.98 | 55994.09 | 99 |
| 115522 | 3275 | 6075 | 58676.01 | 55997.49 | 99 |
| 115730 | 3275 | 6087.5 | 58668.35 | 55990.51 | 99 |
| 115754 | 3275 | 6100 | 58685.52 | 56007.05 | 99 |
| 115826 | 3275 | 6112.5 | 58687.92 | 56008.58 | 99 |

## Raw Diurnal Corrected Magnetic Data - CS6-7
## Sovereign Mining and Exploration Ltd.

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 115846 | 3275 | 6125 | 58684.92 | 56005.17 | 99 |
| 115910.8 | 3275 | 6137.5 | 58680.02 | 55999.88 | 99 |
| 115946 | 3275 | 6150 | 58693.58 | 56013.25 | 99 |
| 120042 | 3275 | 6162.5 | 58687.9 | 56007.35 | 99 |
| 120122 | 3275 | 6175 | 58692.33 | 56011.53 | 99 |
| 120158 | 3275 | 6187.5 | 58688.77 | 56008.07 | 99 |
| 120222 | 3275 | 6200 | 58687.31 | 56006.68 | 99 |
| 120242 | 3275 | 6212.5 | 58686.85 | 56006.2 | 99 |
| 120302 | 3275 | 6225 | 58692.15 | 56011.66 | 99 |
| 120426 | 3325 | 6225 | 58686.65 | 56007.14 | 99 |
| 120454 | 3325 | 6212.5 | 58678.72 | 55999.11 | 99 |
| 120514 | 3325 | 6200 | 58684.99 | 56005.48 | 99 |
| 120546 | 3325 | 6187.5 | 58683.35 | 56003.44 | 99 |
| 120614 | 3325 | 6175 | 58679.82 | 55999.76 | 99 |
| 120742 | 3325 | 6162.5 | 58688.11 | 56007.93 | 99 |
| 120802 | 3325 | 6150 | 58701.14 | 56021.16 | 99 |
| 120834 | 3325 | 6137.5 | 58693.19 | 56013.36 | 99 |
| 120854 | 3325 | 6125 | 58682.46 | 56002.46 | 99 |
| 120918 | 3325 | 6112.5 | 58691.74 | 56011.61 | 99 |
| 120958 | 3325 | 6100 | 58706.06 | 56026.1 | 99 |
| 121022 | 3325 | 6087.5 | 58697.09 | 56017.25 | 99 |
| 121050 | 3325 | 6075 | 58694.05 | 56014.15 | 99 |
| 121138 | 3325 | 6062.5 | 58690.58 | 56010.37 | 99 |
| 121202 | 3325 | 6050 | 58682.83 | 56002.87 | 99 |
| 121234 | 3325 | 6037.5 | 58691.09 | 56011.55 | 99 |
| 121254 | 3325 | 6025 | 58684.57 | 56005.22 | 99 |
| 121334 | 3325 | 6012.5 | 58691.48 | 56012.59 | 99 |
| 121358 | 3325 | 6000 | 58679.36 | 56000.19 | 99 |
| 121438 | 3325 | 5987.5 | 58669.6 | 55989.74 | 99 |
| 121506 | 3325 | 5975 | 58672.75 | 55992.57 | 99 |
| 121530 | 3325 | 5962.5 | 58670.68 | 55990.41 | 99 |
| 121546 | 3325 | 5950 | 58683.22 | 56002.93 | 99 |
| 121614 | 3325 | 5937.5 | 58674.11 | 55993.64 | 99 |
| 121642 | 3325 | 5925 | 58692.22 | 56011.74 | 99 |
| 121714 | 3325 | 5912.5 | 58699.67 | 56019.24 | 99 |
| 121742 | 3325 | 5900 | 58704.8 | 56024.35 | 99 |
| 121810 | 3325 | 5887.5 | 58697.08 | 56016.97 | 99 |
| 121834 | 3325 | 5875 | 58668.34 | 55988.28 | 99 |
| 121858 | 3325 | 5862.5 | 58675.44 | 55995.34 | 99 |
| 121922 | 3325 | 5850 | 58677.88 | 55997.56 | 99 |
| 122006 | 3325 | 5837.5 | 58689.88 | 56009.62 | 99 |
| 122050 | 3325 | 5825 | 58693.97 | 56014.09 | 99 |
| 122202 | 3325 | 5812.5 | 58695.35 | 56015.03 | 99 |
| 122234.6 | 3325 | 5800 | 58698.38 | 56017.79 | 99 |
| 122306 | 3325 | 5787.5 | 58679.01 | 55998.22 | 99 |
| 122334 | 3325 | 5775 | 58687.3 | 56006.27 | 99 |
| 122402 | 3325 | 5762.5 | 58686.64 | 56005.34 | 99 |
| 122430 | 3325 | 5750 | 58696.17 | 56014.59 | 99 |
| 122454 | 3325 | 5737.5 | 58691.51 | 56009.89 | 99 |
| 122514 | 3325 | 5725 | 58683.1 | 56001.32 | 99 |
| 122542 | 3325 | 5712.5 | 58691.21 | 56009.52 | 99 |
| 122610 | 3325 | 5700 | 58685.03 | 56003.76 | 99 |
| 122638 | 3325 | 5687.5 | 58680.5 | 55999.81 | 99 |
| 122654 | 3325 | 5675 | 58680.22 | 55999.89 | 99 |
| 122718 | 3325 | 5662.5 | 58688.11 | 56008.24 | 99 |
| 122734 | 3325 | 5650 | 58681.13 | 56001.39 | 99 |
| 122758 | 3325 | 5637.5 | 58681.88 | 56002.09 | 99 |
| 122826 | 3325 | 5625 | 58681.21 | 56001.42 | 99 |
| 123518.4 | 3375 | 5625 | 58666.38 | 55984.94 | 99 |
| 123602 | 3375 | 5637.5 | 58674.33 | 55993.07 | 99 |
| 123630 | 3375 | 5650 | 58670.61 | 55989.17 | 99 |
| 123706 | 3375 | 5662.5 | 58670.2 | 55988.05 | 99 |
| 123722 | 3375 | 5675 | 58676.17 | 55993.54 | 99 |
| 123742 | 3375 | 5687.5 | 58678.46 | 55995.42 | 99 |
| 123806 | 3375 | 5700 | 58679.75 | 55996.53 | 99 |
| 123850 | 3375 | 5712.5 | 58688.43 | 56005.75 | 99 |
| 123914 | 3375 | 5725 | 58668.29 | 55985.85 | 99 |
| 123946 | 3375 | 5737.5 | 58689.5 | 56007.68 | 99 |
| 124018 | 3375 | 5750 | 58672.67 | 55991.26 | 99 |
| 124042 | 3375 | 5762.5 | 58684.56 | 56003.24 | 99 |
| 124102 | 3375 | 5775 | 58683.71 | 56002.45 | 99 |
| 124138 | 3375 | 5787.5 | 58674.1 | 55992.42 | 99 |
| 124158 | 3375 | 5800 | 58681.99 | 56000 | 99 |
| 124230 | 3375 | 5812.5 | 58695.78 | 56013.07 | 99 |
| 124314 | 3375 | 5825 | 58692.21 | 56009.03 | 99 |
| 124350 | 3375 | 5837.5 | 58685.57 | 56002.83 | 99 |
| 124414 | 3375 | 5850 | 58682.61 | 56000.19 | 99 |
| 124434 | 3375 | 5862.5 | 58686.52 | 56004.34 | 99 |
| 124454 | 3375 | 5875 | 58694.01 | 56011.97 | 99 |
| 124530 | 3375 | 5887.5 | 58682.48 | 56000.53 | 99 |
| 124602 | 3375 | 5900 | 58694.1 | 56012.53 | 99 |
| 124630 | 3375 | 5912.5 | 58676.93 | 55995.76 | 99 |
| 124658 | 3375 | 5925 | 58682.22 | 56001.14 | 99 |
| 124742 | 3375 | 5937.5 | 58690.34 | 56009.05 | 99 |
| 124802 | 3375 | 5950 | 58684.32 | 56002.88 | 99 |
| 124838 | 3375 | 5962.5 | 58683.12 | 56001.73 | 99 |
| 124858 | 3375 | 5975 | 58696.84 | 56015.43 | 99 |
| 125002 | 3375 | 5987.5 | 58691.4 | 56009.01 | 99 |
| 125026 | 3375 | 6000 | 58691.64 | 56008.66 | 99 |

**Raw Diurnal Corrected Magnetic Data - CS6-7**
**Sovereign Mining and Exploration Ltd.**

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 125130 | 3375 | 6012.5 | 58702.65 | 56018.87 | 99 |
| 125150 | 3375 | 6025 | 58696.24 | 56012.57 | 99 |
| 125218 | 3375 | 6037.5 | 58687.49 | 56004.28 | 99 |
| 125242 | 3375 | 6050 | 58691.62 | 56009.01 | 99 |
| 125318 | 3375 | 6062.5 | 58702.32 | 56020.18 | 99 |
| 125338 | 3375 | 6075 | 58705.12 | 56023.04 | 99 |
| 125406 | 3375 | 6087.5 | 58688.49 | 56006.15 | 99 |
| 125430 | 3375 | 6100 | 58696.54 | 56013.92 | 99 |
| 125502 | 3375 | 6112.5 | 58695.96 | 56012.92 | 99 |
| 125526 | 3375 | 6125 | 58693.22 | 56009.97 | 99 |
| 125550 | 3375 | 6137.5 | 58692.36 | 56009.16 | 99 |
| 125610 | 3375 | 6150 | 58689.17 | 56006.08 | 99 |
| 125638 | 3375 | 6162.5 | 58692.23 | 56009.12 | 99 |
| 125654 | 3375 | 6175 | 58692.55 | 56009.45 | 99 |
| 125750 | 3375 | 6187.5 | 58690.24 | 56007.71 | 99 |
| 125810 | 3375 | 6200 | 58695.48 | 56012.98 | 99 |
| 125838 | 3375 | 6212.5 | 58691.87 | 56009.13 | 99 |
| 125910.6 | 3375 | 6225 | 58683.28 | 56000.28 | 99 |
| 132714 | 3425 | 5625 | 58667.53 | 55985.01 | 99 |
| 132814 | 3425 | 5637.5 | 58680.21 | 55998 | 99 |
| 132834 | 3425 | 5650 | 58684.82 | 56002.87 | 99 |
| 132910 | 3425 | 5662.5 | 58680.29 | 55998.17 | 99 |
| 132934 | 3425 | 5675 | 58683.04 | 56000.08 | 99 |
| 133002 | 3425 | 5687.5 | 58670.57 | 55987.47 | 99 |
| 133046 | 3425 | 5700 | 58685.75 | 56003.3 | 99 |
| 133310 | 3425 | 5712.5 | 58671.9 | 55990.18 | 99 |
| 133418 | 3425 | 5725 | 58662.19 | 55981.7 | 99 |
| 133442 | 3425 | 5737.5 | 58667.63 | 55987.27 | 99 |
| 133502 | 3425 | 5750 | 58673.6 | 55993.29 | 99 |
| 133530 | 3425 | 5762.5 | 58674.13 | 55994.3 | 99 |
| 133634 | 3425 | 5775 | 58678.75 | 56001.07 | 99 |
| 133722 | 3425 | 5787.5 | 58679.21 | 56002.12 | 99 |
| 133730 | 3425 | 5800 | 58679.51 | 56002.34 | 99 |
| 133814 | 3425 | 5812.5 | 58675.86 | 55998.87 | 99 |
| 133838 | 3425 | 5825 | 58674.35 | 55997.72 | 99 |
| 133926 | 3425 | 5837.5 | 58673.86 | 55997.04 | 99 |
| 134002 | 3425 | 5850 | 58678.75 | 56001.94 | 99 |
| 134042 | 3425 | 5862.5 | 58678.9 | 56003.25 | 99 |
| 134210 | 3425 | 5875 | 58667.35 | 55993.62 | 99 |
| 134238 | 3425 | 5887.5 | 58674.66 | 56000.7 | 99 |
| 134342 | 3425 | 5900 | 58680.99 | 56005.91 | 99 |
| 134430 | 3425 | 5912.5 | 58668.22 | 55992.78 | 99 |
| 134454 | 3425 | 5925 | 58664.38 | 55988.61 | 99 |
| 134538 | 3425 | 5937.5 | 58666.5 | 55990.19 | 99 |
| 134642 | 3425 | 5950 | 58666.76 | 55990.5 | 99 |
| 134714 | 3425 | 5962.5 | 58674.56 | 55997.23 | 99 |
| 134746 | 3425 | 5975 | 58674.33 | 55995.85 | 99 |
| 134814 | 3425 | 5987.5 | 58679.76 | 56000.52 | 99 |
| 134830 | 3425 | 6000 | 58676.31 | 55996.8 | 99 |
| 134854 | 3425 | 6012.5 | 58676.17 | 55996.38 | 99 |
| 134914 | 3425 | 6025 | 58678.29 | 55998.38 | 99 |
| 134934 | 3425 | 6037.5 | 58681.22 | 56001.08 | 99 |
| 141114 | 3425 | 6050 | 58697.11 | 56004.49 | 99 |
| 141506.8 | 3425 | 6062.5 | 58708.91 | 56012.94 | 99 |
| 141526 | 3425 | 6075 | 58715.44 | 56019.81 | 99 |
| 141630 | 3425 | 6087.5 | 58718.44 | 56021.68 | 99 |
| 141650 | 3425 | 6100 | 58716.56 | 56019.52 | 99 |
| 141722 | 3425 | 6112.5 | 58710.56 | 56013.97 | 99 |
| 141818 | 3425 | 6125 | 58711.75 | 56016.02 | 99 |
| 141926 | 3425 | 6137.5 | 58712 | 56016.75 | 99 |
| 142006 | 3425 | 6150 | 58708.91 | 56014.25 | 99 |
| 142126 | 3425 | 6162.5 | 58723.67 | 56028.44 | 99 |
| 142154 | 3425 | 6175 | 58712.22 | 56016.93 | 99 |
| 142250 | 3425 | 6187.5 | 58707.48 | 56013.01 | 99 |
| 142342 | 3425 | 6200 | 58711.84 | 56017.52 | 99 |
| 142446 | 3425 | 6212.5 | 58705.64 | 56010.85 | 99 |
| 142506 | 3425 | 6225 | 58718.32 | 56023.44 | 99 |
| 142854 | 3475 | 6225 | 58725.81 | 56024.5 | 99 |
| 142930 | 3475 | 6212.5 | 58727.4 | 56026.07 | 99 |
| 142954 | 3475 | 6200 | 58715.15 | 56013.88 | 99 |
| 143026 | 3475 | 6187.5 | 58702.89 | 56001.92 | 99 |
| 143118 | 3475 | 6175 | 58708.47 | 56007.86 | 99 |
| 143150 | 3475 | 6162.5 | 58730.2 | 56029.73 | 99 |
| 143250 | 3475 | 6150 | 58716.72 | 56015.93 | 99 |
| 143326 | 3475 | 6137.5 | 58710.69 | 56009.6 | 99 |
| 143402 | 3475 | 6125 | 58711.53 | 56010.19 | 99 |
| 143522 | 3475 | 6112.5 | 58712.38 | 56011.34 | 99 |
| 143554 | 3475 | 6100 | 58707.64 | 56006.8 | 99 |
| 143634 | 3475 | 6087.5 | 58706.26 | 56006.9 | 99 |
| 143706 | 3475 | 6075 | 58705.87 | 56008.14 | 99 |
| 143814 | 3475 | 6062.5 | 58706.34 | 56010.11 | 99 |
| 143842 | 3475 | 6050 | 58708.91 | 56012.68 | 99 |
| 143910 | 3475 | 6037.5 | 58703.34 | 56007.2 | 99 |
| 143934 | 3475 | 6037.5 | 58710.82 | 56014.42 | 99 |
| 143958 | 3475 | 6025 | 58702.15 | 56005.66 | 99 |
| 144018 | 3475 | 6012.5 | 58705.87 | 56009.65 | 99 |
| 144034 | 3475 | 6000 | 58708.92 | 56012.97 | 99 |
| 144210 | 3475 | 5987.5 | 58711.93 | 56016.19 | 99 |
| 144306 | 3475 | 5975 | 58715.15 | 56018.53 | 99 |

**Raw Diurnal Corrected Magnetic Data - CS6-7**
**Sovereign Mining and Exploration Ltd.**

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 144326 | 3475 | 5962.5 | 58721.45 | 56025.24 | 99 |
| 144346 | 3475 | 5950 | 58709.54 | 56013.93 | 99 |
| 144642 | 3475 | 5937.5 | 58703.6 | 56011.46 | 99 |
| 144738 | 3475 | 5925 | 58708.92 | 56016.36 | 99 |
| 145142 | 3475 | 5912.5 | 58715.89 | 56014.25 | 99 |
| 145522 | 3475 | 5900 | 58707.53 | 55998.65 | 99 |
| 145554 | 3475 | 5887.5 | 58730.62 | 56022.02 | 99 |
| 145618 | 3475 | 5875 | 58716.24 | 56008.78 | 99 |
| 132210 | 3475 | 5862.5 | 58693.25 | 56009.37 | 99 |
| 132226 | 3475 | 5850 | 58696.11 | 56012.32 | 99 |
| 132250 | 3475 | 5837.5 | 58699.61 | 56015.77 | 99 |
| 132306 | 3475 | 5825 | 58690.31 | 56006.5 | 99 |
| 132334 | 3475 | 5812.5 | 58698.76 | 56015.1 | 99 |
| 132354 | 3475 | 5800 | 58692.93 | 56009.52 | 99 |
| 132430 | 3475 | 5787.5 | 58695.42 | 56012.11 | 99 |
| 132454 | 3475 | 5775 | 58683.54 | 55999.81 | 99 |
| 132502 | 3475 | 5775 | 58687.08 | 56003.77 | 99 |
| 132650 | 3475 | 5762.5 | 58681.89 | 55998.27 | 99 |
| 132710 | 3475 | 5750 | 58684.11 | 56000.79 | 99 |
| 132730 | 3475 | 5737.5 | 58687.93 | 56004.04 | 99 |
| 132750 | 3475 | 5725 | 58680.98 | 55997.65 | 99 |
| 132814 | 3475 | 5712.5 | 58681.92 | 55998.29 | 99 |
| 132838 | 3475 | 5700 | 58690.71 | 56006.71 | 99 |
| 132906 | 3475 | 5687.5 | 58687.61 | 56003.6 | 99 |
| 132930 | 3475 | 5675 | 58693.76 | 56009.97 | 99 |
| 132950 | 3475 | 5662.5 | 58690.37 | 56006.56 | 99 |
| 133010 | 3475 | 5650 | 58701.29 | 56017.82 | 99 |
| 133030 | 3475 | 5637.5 | 58694.21 | 56009.84 | 99 |
| 133050 | 3475 | 5625 | 58684.59 | 56000.73 | 99 |
| 133138 | 3525 | 5625 | 58681.64 | 55997.09 | 99 |
| 133158 | 3525 | 5637.5 | 58676.6 | 55992.3 | 99 |
| 133214 | 3525 | 5650 | 58680 | 55995.64 | 99 |
| 133238 | 3525 | 5662.5 | 58689.54 | 56005.1 | 99 |
| 133310 | 3525 | 5675 | 58685.95 | 56001.96 | 99 |
| 133334 | 3525 | 5687.5 | 58686.52 | 56003.13 | 99 |
| 133402 | 3525 | 5700 | 58687.26 | 56004.04 | 99 |
| 133430 | 3525 | 5712.5 | 58692.07 | 56009.23 | 99 |
| 133454 | 3525 | 5725 | 58680.7 | 55998.01 | 99 |
| 133514 | 3525 | 5737.5 | 58682.04 | 55999.37 | 99 |
| 133530 | 3525 | 5750 | 58678.31 | 55995.74 | 99 |
| 133558 | 3525 | 5762.5 | 58677.04 | 55994.4 | 99 |
| 133626 | 3525 | 5775 | 58682.35 | 56000.05 | 99 |
| 133654 | 3525 | 5787.5 | 58691.8 | 56009.88 | 99 |
| 133714 | 3525 | 5800 | 58681.15 | 55998.88 | 99 |
| 133738 | 3525 | 5812.5 | 58684.42 | 56002.74 | 99 |
| 133806 | 3525 | 5825 | 58690.82 | 56009.4 | 99 |
| 133838 | 3525 | 5837.5 | 58684.43 | 56002.99 | 99 |
| 133858 | 3525 | 5850 | 58680.12 | 55998.53 | 99 |
| 133934 | 3525 | 5862.5 | 58684.95 | 56002.95 | 99 |
| 133954 | 3525 | 5875 | 58685.53 | 56003.5 | 99 |
| 134030 | 3525 | 5887.5 | 58687.65 | 56004.99 | 99 |
| 134142 | 3525 | 5900 | 58685.7 | 56002.1 | 99 |
| 134158 | 3525 | 5912.5 | 58687.62 | 56004.31 | 99 |
| 134214 | 3525 | 5925 | 58686.59 | 56002.52 | 99 |
| 134234 | 3525 | 5937.5 | 58694.9 | 56010.77 | 99 |
| 134258 | 3525 | 5950 | 58703.83 | 56018.81 | 99 |
| 134318 | 3525 | 5962.5 | 58695.11 | 56009.57 | 99 |
| 134338 | 3525 | 5975 | 58693.77 | 56007.65 | 99 |
| 134358 | 3525 | 5987.5 | 58698.27 | 56011.78 | 99 |
| 134422 | 3525 | 6000 | 58691.74 | 56005.26 | 99 |
| 134446 | 3525 | 6012.5 | 58698.37 | 56011.66 | 99 |
| 134514 | 3525 | 6025 | 58690.47 | 56003.78 | 99 |
| 134610 | 3525 | 6037.5 | 58695.35 | 56007.83 | 99 |
| 134642 | 3575 | 6025 | 58698.37 | 56010.46 | 99 |
| 134714 | 3575 | 6012.5 | 58701.77 | 56013.87 | 99 |
| 134738 | 3575 | 6000 | 58694.85 | 56007.1 | 99 |
| 134806 | 3575 | 5987.5 | 58695.46 | 56008.21 | 99 |
| 134830 | 3575 | 5975 | 58689.41 | 56002.21 | 99 |
| 134910 | 3575 | 5962.5 | 58689.63 | 56003.24 | 99 |
| 134930 | 3575 | 5950 | 58691.03 | 56004.32 | 99 |
| 135022 | 3575 | 5937.5 | 58690.13 | 56003.95 | 99 |
| 135050 | 3575 | 5925 | 58694.54 | 56008.33 | 99 |
| 135114 | 3575 | 5912.5 | 58697.31 | 56010.67 | 99 |
| 135146 | 3575 | 5900 | 58689.63 | 56002.84 | 99 |
| 135214 | 3575 | 5887.5 | 58700.49 | 56013.83 | 99 |
| 135234 | 3575 | 5875 | 58693.38 | 56006.91 | 99 |
| 135302 | 3575 | 5862.5 | 58692.74 | 56007 | 99 |
| 135334 | 3575 | 5850 | 58699.86 | 56014.77 | 99 |
| 135354 | 3575 | 5837.5 | 58700.27 | 56015.04 | 99 |
| 135414 | 3575 | 5825 | 58681.08 | 55996.21 | 99 |
| 135438 | 3575 | 5812.5 | 58687.76 | 56003.39 | 99 |
| 135502 | 3575 | 5800 | 58696.25 | 56012.37 | 99 |
| 135526 | 3575 | 5787.5 | 58700.94 | 56017.72 | 99 |
| 135634 | 3575 | 5775 | 58702.16 | 56019.98 | 99 |
| 135658 | 3575 | 5762.5 | 58695.15 | 56013.21 | 99 |
| 135726 | 3575 | 5750 | 58687.5 | 56005.86 | 99 |
| 135750 | 3575 | 5737.5 | 58688.39 | 56007.36 | 99 |
| 135814 | 3575 | 5725 | 58690.05 | 56008.84 | 99 |
| 135846 | 3575 | 5712.5 | 58683.37 | 56002.34 | 99 |

**Raw Diurnal Corrected Magnetic Data - CS6-7**
**Sovereign Mining and Exploration Ltd.**

| time | line | station | Raw Magnetics (nT) | Corrected Magnetics (nT) | FieldStrength |
|---|---|---|---|---|---|
| 135914 | 3575 | 5700 | 58690.65 | 56009.8 | 99 |
| 135954 | 3575 | 5687.5 | 58691.85 | 56011.83 | 99 |
| 140050 | 3575 | 5675 | 58689.05 | 56009.21 | 99 |
| 140422 | 3575 | 5662.5 | 58686.25 | 56006.14 | 99 |
| 140454 | 3575 | 5650 | 58688.45 | 56008.68 | 99 |
| 140802 | 3575 | 5637.5 | 58694 | 56013.6 | 99 |
| 140742 | 3575 | 5625 | 58699.36 | 56019.5 | 99 |
| 140930 | 3625 | 5625 | 58680.87 | 55999.63 | 99 |
| 141002 | 3625 | 5637.5 | 58691.74 | 56010.49 | 99 |
| 141018 | 3625 | 5650 | 58680.34 | 55998.65 | 99 |
| 141050 | 3625 | 5662.5 | 58690.01 | 56008.62 | 99 |
| 141114 | 3625 | 5675 | 58676.27 | 55995.43 | 99 |
| 141138 | 3625 | 5687.5 | 58684.44 | 56003.51 | 99 |
| 141202 | 3625 | 5700 | 58682.24 | 56001.34 | 99 |
| 141226 | 3625 | 5712.5 | 58677.33 | 55996.59 | 99 |
| 141242 | 3625 | 5725 | 58679.99 | 55998.67 | 99 |
| 141302 | 3625 | 5737.5 | 58689.7 | 56008.4 | 99 |
| 141322 | 3625 | 5750 | 58681.93 | 56000.6 | 99 |
| 141346 | 3625 | 5762.5 | 58688.88 | 56007.47 | 99 |
| 141406 | 3625 | 5775 | 58691.65 | 56010.68 | 99 |
| 141430 | 3625 | 5787.5 | 58690.8 | 56010.3 | 99 |
| 141450 | 3625 | 5800 | 58696.19 | 56015.74 | 99 |
| 141510 | 3625 | 5812.5 | 58684.08 | 56003.98 | 99 |
| 141534 | 3625 | 5825 | 58685.81 | 56005.64 | 99 |
| 141602 | 3625 | 5837.5 | 58685.65 | 56005.65 | 99 |
| 141622 | 3625 | 5850 | 58686.52 | 56006.79 | 99 |
| 141646 | 3625 | 5862.5 | 58682.23 | 56002.61 | 99 |
| 141714 | 3625 | 5875 | 58688.43 | 56008.8 | 99 |
| 141734 | 3625 | 5887.5 | 58686.19 | 56006.09 | 99 |
| 141802 | 3625 | 5900 | 58686.04 | 56005.44 | 99 |
| 141826 | 3625 | 5912.5 | 58684.42 | 56003.37 | 99 |
| 141846 | 3625 | 5925 | 58690.12 | 56008.62 | 99 |
| 141906 | 3625 | 5937.5 | 58689.51 | 56007.86 | 99 |
| 141930 | 3625 | 5950 | 58691.79 | 56009.57 | 99 |
| 142010 | 3625 | 5962.5 | 58687.35 | 56004.22 | 99 |
| 142050 | 3625 | 5975 | 58691.68 | 56007.78 | 99 |
| 142122 | 3625 | 5987.5 | 58691.78 | 56007.39 | 99 |
| 142150 | 3625 | 6000 | 58682.47 | 55997.85 | 99 |
| 142218 | 3625 | 6012.5 | 58686.8 | 56001.92 | 99 |
| 142302 | 3625 | 6025 | 58687.01 | 56002 | 99 |
| 143326 | 3675 | 5625 | 58677.67 | 55994.48 | 99 |
| 143358 | 3675 | 5637.5 | 58679.71 | 55996.51 | 99 |
| 143418 | 3675 | 5650 | 58675.04 | 55991.78 | 99 |
| 143442 | 3675 | 5662.5 | 58686.68 | 56003.62 | 99 |
| 143502 | 3675 | 5675 | 58680.81 | 55997.66 | 99 |
| 143522 | 3675 | 5687.5 | 58684.06 | 56000.93 | 99 |
| 143542 | 3675 | 5700 | 58673.78 | 55990.64 | 99 |
| 143622 | 3675 | 5712.5 | 58675.27 | 55992.66 | 99 |
| 143642 | 3675 | 5725 | 58681.79 | 55998.73 | 99 |
| 143714 | 3675 | 5737.5 | 58688.3 | 56005.33 | 99 |
| 143746 | 3675 | 5750 | 58689.93 | 56006.85 | 99 |
| 143810 | 3675 | 5762.5 | 58689.14 | 56005.8 | 99 |
| 143826 | 3675 | 5775 | 58687.98 | 56004.66 | 99 |
| 143850 | 3675 | 5787.5 | 58684.18 | 56000.71 | 99 |
| 143910 | 3675 | 5800 | 58688.32 | 56004.85 | 99 |
| 143930 | 3675 | 5812.5 | 58687.85 | 56004.44 | 99 |
| 143950 | 3675 | 5825 | 58690.12 | 56006.61 | 99 |
| 144018 | 3675 | 5837.5 | 58690.25 | 56006.26 | 99 |
| 144034.1 | 3675 | 5850 | 58690.52 | 56006.58 | 99 |
| 144102 | 3675 | 5862.5 | 58699.26 | 56015.2 | 99 |
| 144126 | 3675 | 5875 | 58693.11 | 56009.17 | 99 |
| 144150 | 3675 | 5887.5 | 58693.36 | 56009.5 | 99 |
| 144210 | 3675 | 5900 | 58693.12 | 56009.28 | 99 |
| 144238 | 3675 | 5912.5 | 58701.83 | 56017.8 | 99 |
| 144254 | 3675 | 5925 | 58700.37 | 56016.33 | 99 |
| 144326 | 3675 | 5937.5 | 58705.07 | 56021.3 | 99 |
| 144346 | 3675 | 5950 | 58694.68 | 56010.89 | 99 |
| 144418.2 | 3675 | 5962.5 | 58692 | 56008.69 | 99 |
| 144442 | 3675 | 5975 | 58693.09 | 56009.69 | 99 |
| 144518 | 3675 | 5987.5 | 58690.85 | 56007.6 | 99 |
| 144542 | 3675 | 6000 | 58694.08 | 56010.88 | 99 |
| 144602 | 3675 | 6012.5 | 58691.2 | 56008.25 | 99 |
| 144634 | 3675 | 6025 | 58690.76 | 56007.88 | 99 |

# APPENDIX 3
# 2002-2003 DIAMOND INDICATOR RESULTS

## 2002 - 2003 Diamond Indicator Totals - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Date | Sampler | UMT Easting N27 | UTM Northing N27 | Pyrope | Eclogitic Garnet | Chrome Diopside | Cr-Gross | Olivine | Picroilmenite | Chromite | Total Silicates | Total Oxides | Total Silicates Picroilmenite | Total All DIMs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02BWH001 | Pan Con | 25-Oct | BW | 543192 | 6034194 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH002 | Pan Con | 25-Oct | BW | 541234 | 6031587 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH003 | Beach | 31-Oct | BW | 512565 | 6034805 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH004 | Beach | 31-Oct | BW | 512510 | 6034574 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH005 | Pan Con | 1-Nov | BW | 507683 | 6057601 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 02BWH006 | Pan Con | 1-Nov | BW | 525393 | 6050432 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 02BWH007 | Pan Con | 2-Nov | BW/WC | 523913 | 6077223 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH008 | Pan Con | 2-Nov | BW/WC | 521778 | 6076871 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 02BWH009 | Pan Con | 2-Nov | BW/WC | 521125 | 6076909 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 7 |
| 02BWH010 | Pan Con | 3-Nov | BW/WC | 520804 | 6080359 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 3 |
| 02BWH011 | Pan Con | 3-Nov | BW/WC | 521736 | 6080478 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH012 | Pan Con | 3-Nov | BW/WC | 521697 | 6080407 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 |
| 02BWH013 | Pan Con | 3-Nov | BW/WC | 519860 | 6083018 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 2 | 3 | 2 | 5 |
| 02BWH014 | Pan Con | 4-Nov | BW/WC | 521447 | 6071161 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 |
| 02BWH015 | Pan Con | 4-Nov | BW/WC | 517447 | 6070996 | 1 | 1 | 0 | 0 | 0 | 0 | 4 | 2 | 4 | 2 | 6 |
| 02BWH016 | Pan Con | 4-Nov | BW/WC | 512938 | 6071389 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 |
| 02BWH017 | Pan Con | 4-Nov | BW/WC | 513387 | 6070512 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 02BWH018 | Pan Con | 6-Nov | BW/WC | 524032 | 6105754 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH019 | Pan Con | 6-Nov | BW/WC | 524851 | 6104069 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH020 | Pan Con | 6-Nov | BW/WC | 521781 | 6097986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH021 | Pan Con | 6-Nov | BW/WC | 522229 | 6101511 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02BWH022 | Pan Con | 8-Nov | BW/WC | 537266 | 6083335 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 3 | 2 | 3 | 5 |
| 02BWH023 | Pan Con | 8-Nov | BW/WC | 536301 | 6080230 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 3 |
| 02BWH024 | Pan Con | 8-Nov | BW/WC | 533345 | 6086447 | 2 | 0 | 0 | 0 | 1 | 0 | 4 | 3 | 4 | 3 | 7 |
| 02BWH025 | Pan Con | 8-Nov | BW/WC | 533462 | 6084326 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 |
| 02BWH026 | Pan Con | 19-Nov | BW/CP | 541766 | 6089963 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 4 |
| 02BWH027 | Pan Con | 19-Nov | BW/CP | 531896 | 6092778 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 |
| 02CPH001 | Pan Con | 23-Oct | CP/HK | 555745 | 6034004 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 4 |
| 02CPH002 | Pan Con | 23-Oct | CP/HK | 556848 | 6033502 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 3 | 1 | 4 |
| 02CPH003 | Pan Con | 24-Oct | CP | 537272 | 6040839 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 02CPH004 | Pan Con | 24-Oct | CP | 534606 | 6040594 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02HKH001 | Pan Con | 24-Oct | BW/HK | 555977 | 6031735 | 1 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 9 | 1 | 10 |
| 02HKH002 | Pan Con | 24-Oct | HK | 539711 | 6039312 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 02HKH003 | Pan Con | 24-Oct | HK | 542325 | 6046363 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 3 |
| 02MDH100 | Beach | 2-Nov | MD | 511549 | 6107259 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02MDH101 | Beach | 2-Nov | MD | 517684 | 6108161 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 4 | 4 |
| 02MDH102 | Pan Con | 2-Nov | MD | 513619 | 6094434 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 |
| 02MDH103 | Pan Con | 2-Nov | MD | 513505 | 6094322 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02MDH104 | Suction Dedge | 2-Nov | MD | 518048 | 6066707 | 0 | 1 | 0 | 0 | 1 | 1 | 15 | 2 | 16 | 3 | 18 |
| 02MDH105 | Suction Dedge | 3-Nov | MD | 517087 | 6073974 | 1 | 0 | 0 | 0 | 0 | 2 | 23 | 1 | 25 | 3 | 26 |
| 02MDH106 | Suction Dedge | 3-Nov | MD | 509423 | 6092937 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 3 |
| 02MDH107 | Suction Dedge | 3-Nov | MD | 506378 | 6095322 | 1 | 4 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | 5 | 6 |
| 02WCH001 | Pan Con | 1-Nov | MD/WC | 514781 | 6044811 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02WCH002 | Pan Con | 1-Nov | MD/WC | 513776 | 6043896 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02WCH003 | Pan Con | 1-Nov | MD/WC | 513315 | 6040184 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 3 |
| 02WCH004 | Pan Con | 1-Nov | MD/WC | 517682 | 6037764 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02WCH005 | Pan Con | 1-Nov | MD/WC | 517674 | 6037705 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 3 |
| 02WCH006 | Pan Con | 1-Nov | MD/WC | 523646 | 6035396 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02ACDGH108 | Suction Dedge | | | 536751 | 6076463 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02CDH103 | Suction Dedge | | | 531900 | 6092775 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 3 | 4 |
| 02CJOH002 | Suction Dedge | | | 580455 | 6047510 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 |
| 03NVT001 | Till | 1-Nov | AM/NV/BW | 532557 | 6083523 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT002 | Till | 1-Nov | AM/NV/BW | 532292 | 6083436 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT003 | Till | 1-Nov | AM/NV/BW | 532097 | 6083249 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT004 | Till | 1-Nov | AM/NV/BW | 531892 | 6083088 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT005 | Till | 1-Nov | AM/NV/BW | 531747 | 6082889 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**2002 - 2003 Diamond Indicator Totals - Swan Hills Property**
**Sovereign Mining and Exploration Ltd.**

| Sample Number | Sample Type | Date | Sampler | UMT Easting N27 | UTM Northing N27 | Pyrope | Eclogitic Garnet | Chrome Diopside | Cr-Gross | Olivine | Picroilmenite | Chromite | Total Silicates | Total Oxides | Total Silicates Picroilmenite | Total All DIMs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03NVT006 | Till | 1-Nov | AM/NV/BW | 531678 | 6082622 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 03NVT007 | Till | 1-Nov | AM/NV/BW | 531675 | 6082393 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 03NVT008 | Till | 1-Nov | AM/NV/BW | 531735 | 6082142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT009 | Till | 2-Nov | AM/NV/BW | 531675 | 6081661 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT010 | Till | 2-Nov | AM/NV/BW | 532128 | 6081408 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT011 | Till | 2-Nov | AM/NV/BW | 531095 | 6077657 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT012 | Till | 3-Nov | NV/AM | 529235 | 6075769 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT013 | Till | 3-Nov | NV/AM | 529466 | 6075843 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT014 | Till | 3-Nov | NV/AM | 529591 | 6075905 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT015 | Till | 3-Nov | NV/AM | 529959 | 6076228 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT016 | Till | 3-Nov | NV/AM | 530190 | 6076336 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT017 | Till | 3-Nov | NV/AM | 530431 | 6076424 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT018 | Till | 3-Nov | NV/AM | 530639 | 6076587 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT019 | Till | 5-Nov | AM/NV | 530986 | 6076674 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT020 | Till | 5-Nov | AM/NV | 531214 | 6077145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT021 | Till | 6-Nov | AM/NV/PW | 531054 | 6078181 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT022 | Till | 6-Nov | AM/NV/PW | 531131 | 6078642 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT023 | Till | 6-Nov | AM/NV/PW | 531248 | 6078867 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT024 | Till | 6-Nov | AM/NV/PW | 531494 | 6078925 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT025 | Till | 6-Nov | AM/NV/PW | 531773 | 6079605 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT026 | Till | 6-Nov | AM/NV/PW | 531696 | 6079072 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT027 | Till | 6-Nov | AM/NV/PW | 531828 | 6080153 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT028 | Till | 6-Nov | AM/NV/PW | 531869 | 6080625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT029 | Till | 6-Nov | AM/NV/PW | 532404 | 6081079 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT030 | Till | 9-Nov | PW/AM/NV | 527472 | 6090112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT031 | Till | 8-Nov | PW/AM/NV | 526661 | 6088821 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT032 | Till | 9-Nov | PW/AM/NV | 527297 | 6089887 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 0 | 4 | 4 |
| 03NVT033 | Till | 9-Nov | PW/AM/NV | 527066 | 6089829 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 |
| 03NVT034 | Till | 9-Nov | PW/AM/NV | 527117 | 6089501 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 03NVT035 | Till | 9-Nov | PW/AM/NV | 526942 | 6089292 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT036 | Till | 9-Nov | PW/AM/NV | 526493 | 6088622 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT037 | Till | 9-Nov | PW/AM/NV | 526375 | 6088391 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT038 | Till | 9-Nov | PW/AM/NV | 526210 | 6088204 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT039 | Till | 9-Nov | PW/AM/NV | 526095 | 6087995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT040 | Till | 9-Nov | PW/AM/NV | 525903 | 6087744 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT041 | Till | 10-Nov | NV/AM/PW | 522839 | 6083175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT042 | Till | 10-Nov | NV/AM/PW | 522985 | 6083408 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT043 | Till | 10-Nov | NV/AM/PW | 523119 | 6083625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT044 | Till | 10-Nov | NV/AM/PW | 523272 | 6083825 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT045 | Till | 10-Nov | NV/AM/PW | 523462 | 6084143 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT046 | Till | 10-Nov | NV/AM/PW | 523621 | 6084339 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT047 | Till | 10-Nov | NV/AM/PW | 523742 | 6084549 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT048 | Till | 10-Nov | NV/AM/PW | 523947 | 6084854 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT049 | Till | 10-Nov | NV/AM/PW | 524120 | 6085111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT050 | Till | 10-Nov | NV/AM/PW | 524277 | 6085309 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT051 | Till | 11-Nov | AM/PW | 524408 | 6085528 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT052 | Till | 11-Nov | AM/PW | 524566 | 6085755 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT053 | Till | 11-Nov | AM/PW | 524707 | 6085954 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT054 | Till | 11-Nov | AM/PW | 524833 | 6086164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT055 | Till | 11-Nov | AM/PW | 524987 | 6086366 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT056 | Till | 11-Nov | AM/PW | 525140 | 6086583 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT057 | Till | 11-Nov | AM/PW | 525253 | 6086787 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT058 | Till | 11-Nov | AM/PW | 525390 | 6087019 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT059 | Till | 12-Nov | PW/AM | 525547 | 6087208 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 03NVT060 | Till | 12-Nov | PW/AM | 522679 | 6082949 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT061 | Till | 12-Nov | PW/AM | 525692 | 6087388 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 3 |

## 2002 - 2003 Diamond Indicator Totals - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Date | Sampler | UMT Easting N27 | UTM Northing N27 | Pyrope | Eclogitic Garnet | Chrome Diopside | Cr-Gross | Olivine | Picroilmenite | Chromite | Total Silicates | Total Oxides | Total Silicates Picroilmenite | Total All DIMs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03NVT062 | Till | 12-Nov | PW/AM | 525789 | 6087574 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT063 | Till | 15-Nov | AM/PW | 531523 | 6094924 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT064 | Till | 15-Nov | AM/PW | 532036 | 6094937 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT065 | Till | 15-Nov | AM/PW | 532527 | 6094895 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT066 | Till | 17-Nov | PW/AM | 533013 | 6094830 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT067 | Till | 17-Nov | PW/AM | 533541 | 6094840 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 |
| 03NVT068 | Till | 17-Nov | PW/AM | 534044 | 6094808 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT069 | Till | 17-Nov | PW/AM | 534557 | 6094768 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT070 | Till | 17-Nov | PW/AM | 535047 | 6094705 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT071 | Till | 17-Nov | PW/AM | 535550 | 6094679 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT072 | Till | 17-Nov | PW/AM | 536122 | 6094641 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT073 | Till | 17-Nov | PW/AM | 536619 | 6094676 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 4 | 4 |
| 03NVT074 | Till | 17-Nov | PW/AM | 537157 | 6094714 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 2 |
| 03NVT075 | Till | 17-Nov | PW/AM | 537648 | 6094675 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT076 | Till | 18-Nov | AM/PW | 538206 | 6094984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT077 | Till | 18-Nov | AM/PW | 538641 | 6095146 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT078 | Till | 18-Nov | AM/PW | 539078 | 6095391 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT079 | Till | 18-Nov | AM/PW | 539578 | 6095533 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT080 | Till | 18-Nov | AM/PW | 540067 | 6094564 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT081 | Till | 23-Nov | AM/PW | 522519 | 6098433 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT082 | Till | 23-Nov | AM/PW | 522741 | 6098572 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 3 |
| 03NVT083 | Till | 23-Nov | AM/PW | 522958 | 6098688 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT084 | Till | 23-Nov | AM/PW | 523182 | 6098810 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT085 | Till | 25-Nov | PW/AM | 521633 | 6097935 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT086 | Till | 25-Nov | PW/AM | 521873 | 6098028 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT087 | Till | 25-Nov | PW/AM | 522077 | 6098152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT088 | Till | 25-Nov | PW/AM | 522311 | 6098304 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT089 | Till | 26-Nov | PW/AM | 523422 | 6098946 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT090 | Till | 26-Nov | AM/PW | 521253 | 6097626 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT091 | Till | 26-Nov | AM/PW | 521458 | 6097783 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT092 | Till | 27-Nov | PW/AM | 521010 | 6097460 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT093 | Till | 27-Nov | PW/AM | 520807 | 6097380 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT094 | Till | 27-Nov | PW/AM | 520054 | 6096912 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT095 | Till | 27-Nov | PW/AM | 519844 | 6096802 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT096 | Till | 27-Nov | PW/AM | 519648 | 6096672 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT097 | Till | 28-Nov | AM/PW | 519449 | 6096537 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT098 | Till | 28-Nov | AM/PW | 519240 | 6096397 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT099 | Till | 28-Nov | AM/PW | 519029 | 6096261 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT100 | Till | 28-Nov | AM/PW | 518828 | 6096099 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT101 | Till | 28-Nov | AM/PW | 518648 | 6095937 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT102 | Till | 28-Nov | AM/PW | 518456 | 6095776 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT103 | Till | 28-Nov | AM/PW | 518249 | 6095600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT104 | Till | 29-Nov | PW/AM | 518042 | 6095459 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT105 | Till | 29-Nov | PW/AM | 523631 | 6099089 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT106 | Till | 29-Nov | PW/AM | 523949 | 6099289 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT107 | Till | 29-Nov | PW/AM | 524152 | 6099450 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT108 | Till | 29-Nov | PW/AM | 524391 | 6099563 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT109 | Till | 29-Nov | PW/AM | 524617 | 6099676 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT110 | Till | 2-Dec | PW/AM | 516134 | 6094400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT111 | Till | 2-Dec | PW/AM | 515933 | 6094289 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT112 | Till | 2-Dec | PW/AM | 515716 | 6094159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT113 | Till | 15-Dec | PW/AM | 516573 | 6114682 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT114 | Till | 15-Dec | PW/AM | 515555 | 6114622 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT115 | Till | 15-Dec | PW/AM | 514865 | 6115384 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 2 |
| 03NVT116 | Till | 15-Dec | PW/AM | 514124 | 6114911 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT117 | Till | 15-Dec | PW/AM | 513190 | 6114535 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 2002 - 2003 Diamond Indicator Totals - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Date | Sampler | UMT Easting N27 | UTM Northing N27 | Pyrope | Eclogitic Garnet | Chrome Diopside | Cr-Gross | Olivine | Picroilmenite | Chromite | Total Silicates | Total Oxides | Total Silicates Picroilmenite | Total All DIMs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03NVT118 | Till | 15-Dec | PW/AM | 512481 | 6113794 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT119 | Till | 15-Dec | PW/AM | 512280 | 6112801 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT120 | Till | 15-Dec | PW/AM | 511131 | 6112245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT121 | Till | 15-Dec | PW/AM | 510072 | 6112328 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT122 | Till | 15-Dec | PW/AM | 509008 | 6112065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT123 | Till | 15-Dec | PW/AM | 507766 | 6111994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT124 | Till | 15-Dec | PW/AM | 506512 | 6111963 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT125 | Till | 20-Dec | PW/AM/BA | 547681 | 6037671 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT126 | Till | 20-Dec | PW/AM/BA | 547024 | 6037227 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT127 | Till | 20-Dec | PW/AM/BA | 546528 | 6036566 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT128 | Till | 21-Dec | PW/AM/BA | 546029 | 6036334 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT129 | Till | 21-Dec | PW/AM/BA | 545558 | 6036426 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT130 | Till | 21-Dec | PW/AM/BA | 545105 | 6036629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT131 | Till | 21-Dec | PW/AM/BA | 544709 | 6037032 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT132 | Till | 21-Dec | PW/AM/BA | 544203 | 6036844 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT133 | Till | 21-Dec | PW/AM/BA | 543810 | 6036638 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT134 | Till | 21-Dec | PW/AM/BA | 543339 | 6036969 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT135 | Till | 21-Dec | PW/AM/BA | 542976 | 6037330 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 3 | 3 |
| 03NVT136 | Till | 21-Dec | PW/AM/BA | 542473 | 6037428 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT137 | Till | 21-Dec | PW/AM/BA | 542053 | 6037114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT138 | Till | 21-Dec | PW/AM/BA | 541673 | 6036668 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT139 | Till | 21-Dec | PW/AM/BA | 541173 | 6036222 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT140 | Till | 21-Dec | PW/AM/BA | 540675 | 6035936 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT141 | Till | 21-Dec | PW/AM/BA | 540390 | 6035442 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT142 | Till | 21-Dec | PW/AM/BA | 540286 | 6034954 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 03NVT143 | Till | 21-Dec | PW/AM/BA | 540015 | 6034403 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 03NVT144 | Till | 21-Dec | PW/AM/BA | 539642 | 6033903 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT145 | Till | 21-Dec | PW/AM/BA | 539433 | 6033397 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT146 | Till | 21-Dec | PW/AM/BA | 539005 | 6033224 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT147 | Till | 22-Dec | BA/PW/AM | 556158 | 6031855 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT148 | Till | 22-Dec | BA/PW/AM | 555805 | 6031468 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 03NVT149 | Till | 22-Dec | BA/PW/AM | 555568 | 6030985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT150 | Till | 22-Dec | BA/PW/AM | 555773 | 6030531 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT151 | Till | 22-Dec | BA/PW/AM | 556229 | 6030148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT152 | Till | 22-Dec | BA/PW/AM | 566328 | 6041870 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT153 | Till | 22-Dec | BA/PW/AM | 567688 | 6043455 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT154 | Till | 22-Dec | BA/PW/AM | 568884 | 6045163 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT155 | Till | 22-Dec | BA/PW/AM | 570619 | 6046593 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT156 | Till | 22-Dec | BA/PW/AM | 572284 | 6048023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT400 | Till | 12-Dec | PW/AM/MD | 539573 | 6092586 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT401 | Till | 12-Dec | PW/AM/MD | 539788 | 6092519 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT402 | Till | 13-Dec | AM/PW/MD | 540017 | 6092636 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT403 | Till | 13-Dec | AM/PW/MD | 539933 | 6092705 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT404 | Till | 13-Dec | AM/PW/MD | 539842 | 6092720 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT405 | Till | 14-Dec | MD | 540313 | 6092565 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03NVT406 | Till | 14-Dec | MD | 540313 | 6092565 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*All Samples collected during 2003 (Prefix 03) are pick results only

| Sample# | Min-id Mineral | Pt# | SiO2 | TiO2 | Al2O3 | Cr2O3 | FeO | MgO | MnO | CaO | Na2O | K2O | Total | NiO | ZnO | ZrO2 | Nb2O5 | Picked Mineral |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02BWH-005 | G_02_HIGH_TITANIUM_PYROPE | 1 | 41.76 | 0.91 | 17.52 | 6.26 | 7.43 | 20.17 | 0.23 | 5.65 | 0.05 | 0.03 | 99.99 | na | na | na | na | pos pyrope |
| 02BWH-006 | PICRO_CHROMITE | 1 | 0.00 | 1.33 | 17.24 | 45.02 | 19.64 | 16.68 | 0.18 | na | na | na | 100.46 | 0.2644 | 0.0489 | 0.0557 | 0 | pos chrom |
| 02BWH-008 | G_01_TITANIAN_PYROPE | 2 | 41.34 | 0.81 | 16.56 | 6.31 | 8.05 | 20.30 | 0.31 | 5.61 | 0.09 | 0.00 | 99.38 | na | na | na | na | pos pyrope |
| 02BWH-009 | PICRO_CHROMITE | 2 | 0.12 | 1.23 | 16.47 | 43.78 | 22.50 | 14.58 | 0.20 | na | na | na | 99.26 | 0.2539 | 0.0178 | 0.0637 | 0.0398 | pos chrom |
| 02BWH-009 | PICRO_CHROMITE | 3 | 0.14 | 1.05 | 18.98 | 44.00 | 19.71 | 16.49 | 0.18 | na | na | na | 100.87 | 0.1852 | 0.1174 | 0 | 0.01 | pos chrom |
| 02BWH-009 | PICRO_CHROMITE | 4 | 0.08 | 0.68 | 9.42 | 47.61 | 27.99 | 12.56 | 0.27 | na | na | na | 98.83 | 0.1059 | 0.0573 | 0 | 0.0532 | pos chrom |
| 02BWH-009 | PICRO_CHROMITE | 5 | 0.03 | 0.42 | 17.23 | 45.17 | 23.54 | 12.58 | 0.24 | na | na | na | 99.59 | 0.2013 | 0.141 | 0 | 0.0342 | pos chrom |
| 02BWH-009 | PICRO_CHROMITE | 6 | 0.03 | 0.65 | 10.63 | 44.06 | 31.55 | 11.49 | 0.38 | na | na | na | 98.92 | 0.1011 | 0.0155 | 0 | 0 | pos chrom |
| 02BWH-009 | PICRO_CHROMITE | 7 | 0.04 | 0.10 | 11.02 | 55.01 | 22.46 | 9.63 | 0.41 | na | na | na | 99.09 | 0.0349 | 0.2854 | 0.0172 | 0.0847 | pos chrom |
| 02BWH-009 | PICRO_CHROMITE | 8 | 0.12 | 1.16 | 14.18 | 49.60 | 18.08 | 16.55 | 0.17 | na | na | na | 100.13 | 0.2209 | 0.042 | 0 | 0 | pos chrom |
| 02BWH-010 | G_09_CHROME_PYROPE | 3 | 42.37 | 0.12 | 20.23 | 4.26 | 8.54 | 18.48 | 0.46 | 5.55 | 0.03 | 0.00 | 100.04 | na | na | na | na | def pyrope |
| 02BWH-010 | PICRO_CHROMITE | 34 | 0.04 | 2.19 | 13.90 | 43.40 | 25.35 | 14.18 | 0.19 | na | na | na | 99.67 | 0.3075 | 0.0727 | 0 | 0.0397 | pos chrom |
| 02BWH-010 | PICRO_CHROMITE | 35 | 0.09 | 0.28 | 10.02 | 51.07 | 21.18 | 16.72 | 0.20 | na | na | na | 99.81 | 0.1413 | 0 | 0.0833 | 0.0202 | pos chrom |
| 02BWH-012 | G_09_CHROME_PYROPE | 4 | 42.41 | 0.14 | 20.13 | 4.59 | 6.92 | 19.77 | 0.34 | 5.30 | 0.02 | 0.00 | 99.62 | na | na | na | na | pos pyrope |
| 02BWH-012 | PICRO_CHROMITE | 36 | 0.14 | 2.26 | 12.68 | 42.37 | 27.64 | 12.75 | 0.20 | na | na | na | 98.41 | 0.2506 | 0.0575 | 0.0555 | 0 | pos chrom |
| 02BWH-013 | G_06_PYROPE_GROSSULAR_ALMANDINE | 6 | 41.69 | 0.10 | 22.85 | 0.12 | 10.57 | 12.15 | 0.28 | 12.60 | 0.06 | 0.00 | 100.40 | na | na | na | na | pos eclog |
| 02BWH-013 | G_10_LOW_CALCIUM_CHROME_PYROPE | 5 | 41.92 | 0.05 | 19.59 | 6.07 | 7.31 | 19.45 | 0.38 | 5.72 | 0.02 | 0.00 | 100.52 | na | na | na | na | def pyrope |
| 02BWH-013 | PICRO_CHROMITE | 25 | 0.10 | 1.35 | 15.98 | 43.24 | 23.93 | 14.56 | 0.23 | na | na | na | 99.72 | 0.2083 | 0.0631 | 0.0462 | 0 | pos chrom |
| 02BWH-013 | PICRO_CHROMITE | 26 | 0.13 | 2.99 | 8.80 | 44.26 | 29.98 | 11.57 | 0.34 | na | na | na | 98.25 | 0.1436 | 0.02 | 0 | 0 | pos chrom |
| 02BWH-013 | UNKNOWN (SubPicroChromite) | 24 | 0.05 | 0.09 | 30.61 | 32.05 | 20.98 | 15.86 | 0.18 | na | na | na | 100.16 | 0.1857 | 0.1621 | 0.0087 | 0 | pos chrom |
| 02BWH-014 | SUB_PICRO_CHROMITE | 32 | 0.37 | 0.36 | 24.54 | 37.30 | 19.54 | 17.79 | 0.12 | na | na | na | 100.30 | 0.2556 | 0.0184 | 0 | 0 | pos chrom |
| 02BWH-014 | SUB_PICRO_CHROMITE | 33 | 0.41 | 0.40 | 24.22 | 37.29 | 18.95 | 17.62 | 0.20 | na | na | na | 99.41 | 0.2996 | 0.0162 | 0 | 0.0051 | pos chrom |
| 02BWH-015 | G_03_CALCIC_PYROPE_ALMANDINE | 8 | 41.99 | 0.01 | 22.99 | 0.00 | 11.82 | 14.83 | 0.27 | 8.58 | 0.00 | 0.00 | 100.48 | na | na | na | na | pos eclog |
| 02BWH-015 | G_09_CHROME_PYROPE | 9 | 42.17 | 0.04 | 17.44 | 6.34 | 9.58 | 18.04 | 0.47 | 6.48 | 0.00 | 0.00 | 100.56 | na | na | na | na | pos pyrope |
| 02BWH-015 | PICRO_CHROMITE | 28 | 0.10 | 1.14 | 16.42 | 45.79 | 21.11 | 14.72 | 0.27 | na | na | na | 99.86 | 0.2084 | 0.1021 | 0 | 0 | pos chrom |
| 02BWH-015 | PICRO_CHROMITE | 30 | 0.04 | 0.32 | 16.15 | 45.75 | 27.24 | 8.31 | 0.41 | na | na | na | 98.70 | 0.0395 | 0.4259 | 0 | 0.01 | pos chrom |
| 02BWH-015 | PICRO_CHROMITE | 31 | 0.08 | 0.14 | 8.23 | 56.28 | 26.42 | 8.57 | 0.43 | na | na | na | 100.44 | 0.0501 | 0.185 | 0.0436 | 0 | pos chrom |
| 02BWH-015 | UNKNOWN (PicroChromite) | 29 | 0.11 | 0.03 | 13.58 | 56.35 | 13.34 | 15.91 | 0.24 | na | na | na | 99.87 | 0.1403 | 0.1003 | 0.0636 | 0 | pos chrom |
| 02BWH-016 | CPX_05_CHROME_DIOPSIDE | 11 | 55.73 | 0.17 | 1.46 | 2.49 | 2.60 | 16.61 | 0.12 | 18.32 | 1.85 | 0.03 | 99.39 | na | na | na | na | pos cpx |
| 02BWH-016 | G_12_KNORRINGITIC_UVAROVITE_PYROPE | 28 | 41.40 | 0.17 | 15.50 | 11.02 | 6.71 | 18.62 | 0.42 | 6.27 | 0.03 | 0.00 | 100.13 | na | na | na | na | def pyrope |
| 02BWH-017 | PICRO_CHROMITE | 27 | 0.04 | 1.77 | 6.29 | 45.65 | 36.56 | 9.24 | 0.38 | na | na | na | 100.24 | 0.2215 | 0.0901 | 0 | 0 | pos chrom |
| 02BWH-022 | CPX_02_DIOPSIDE | 13 | 54.26 | 0.06 | 1.31 | 0.75 | 5.68 | 15.25 | 0.22 | 21.36 | 0.70 | 0.00 | 99.58 | na | na | na | na | pos cpx |
| 02BWH-022 | CPX_05_CHROME_DIOPSIDE | 14 | 52.45 | 0.23 | 6.08 | 0.77 | 2.45 | 14.82 | 0.12 | 21.38 | 1.24 | 0.01 | 99.55 | na | na | na | na | pos cpx |
| 02BWH-022 | G_09_CHROME_PYROPE | 12 | 42.65 | 0.09 | 20.29 | 3.99 | 8.47 | 18.91 | 0.58 | 5.13 | 0.02 | 0.00 | 100.13 | na | na | na | na | def pyrope |
| 02BWH-022 | PICRO_CHROMITE | 14 | 0.00 | 0.18 | 17.39 | 50.91 | 17.56 | 12.78 | 0.37 | na | na | na | 99.55 | 0.065 | 0.1936 | 0.0979 | 0.0146 | pos chrom |
| 02BWH-022 | UNKNOWN (SubPicroChromite) | 15 | 0.08 | 1.14 | 21.04 | 29.23 | 34.39 | 11.27 | 0.22 | na | na | na | 97.94 | 0.2647 | 0.1845 | 0 | 0.1299 | pos chrom |
| 02BWH-023 | PICRO_CHROMITE | 21 | 0.09 | 1.07 | 16.46 | 44.84 | 25.47 | 11.75 | 0.33 | na | na | na | 100.29 | 0.1807 | 0.0725 | 0.0278 | 0 | pos chrom |
| 02BWH-023 | PICRO_CHROMITE | 23 | 0.12 | 1.13 | 14.07 | 49.02 | 19.81 | 15.86 | 0.19 | na | na | na | 100.61 | 0.2692 | 0.098 | 0.0185 | 0.0203 | pos chrom |
| 02BWH-023 | SUB_PICRO_CHROMITE | 22 | 0.16 | 0.93 | 22.66 | 38.68 | 22.17 | 14.44 | 0.23 | na | na | na | 99.65 | 0.2199 | 0.0666 | 0.0816 | 0 | pos chrom |
| 02BWH-024 | G_10_LOW_CALCIUM_CHROME_PYROPE | 15 | 42.11 | 0.05 | 17.90 | 7.89 | 6.94 | 19.65 | 0.41 | 5.38 | 0.04 | 0.00 | 100.36 | na | na | na | na | def pyrope |
| 02BWH-024 | G_11_UVAROVITE_PYROPE | 16 | 41.84 | 0.35 | 18.26 | 6.94 | 6.75 | 19.93 | 0.38 | 5.58 | 0.03 | 0.00 | 100.06 | na | na | na | na | def pyrope |
| 02BWH-024 | OLIVINE | 2 | 41.34 | 0.00 | 0.00 | 0.01 | 7.83 | 49.34 | 0.12 | 0.00 | na | na | 99.06 | 0.4198 | na | na | na | pos olivine |
| 02BWH-024 | PICRO_CHROMITE | 17 | 0.00 | 0.06 | 11.38 | 53.70 | 24.43 | 9.19 | 0.40 | na | na | na | 99.57 | 0.038 | 0.3333 | 0 | 0.0445 | pos chrom |
| 02BWH-024 | PICRO_CHROMITE | 18 | 0.06 | 1.18 | 15.94 | 45.14 | 20.15 | 16.08 | 0.17 | na | na | na | 98.98 | 0.2113 | 0 | 0.0372 | 0 | pos chrom |
| 02BWH-024 | PICRO_CHROMITE | 19 | 0.08 | 1.56 | 14.71 | 45.25 | 23.25 | 14.74 | 0.25 | na | na | na | 100.15 | 0.2319 | 0.0691 | 0.0091 | 0 | pos chrom |
| 02BWH-024 | UNKNOWN (PicroChromite) | 20 | 0.10 | 0.27 | 7.06 | 56.31 | 19.45 | 15.99 | 0.25 | na | na | na | 99.73 | 0.075 | 0.0663 | 0.0995 | 0.0545 | pos chrom |
| 02BWH-025 | G_10_LOW_CALCIUM_CHROME_PYROPE | 10 | 41.90 | 0.07 | 18.39 | 6.87 | 7.41 | 18.72 | 0.38 | 6.45 | 0.01 | 0.00 | 100.19 | na | na | na | na | def pyrope |
| 02BWH-025 | PICRO_CHROMITE | 16 | 0.07 | 0.15 | 23.86 | 41.79 | 15.86 | 17.87 | 0.24 | na | na | na | 100.02 | 0.1863 | 0 | 0 | 0 | pos chrom |
| 02BWH-026 | PICRO_CHROMITE | 10 | 0.08 | 0.66 | 9.55 | 44.34 | 28.71 | 14.91 | 0.23 | na | na | na | 98.82 | 0.2076 | 0.0311 | 0 | 0.1061 | pos chrom |
| 02BWH-026 | PICRO_CHROMITE | 13 | 0.05 | 0.38 | 6.57 | 53.37 | 22.74 | 15.60 | 0.27 | na | na | na | 99.13 | 0.1155 | 0.0212 | 0 | 0 | pos chrom |
| 02BWH-026 | UNKNOWN (SubPicroChromite) | 11 | 0.03 | 0.35 | 31.18 | 28.15 | 22.83 | 16.26 | 0.35 | na | na | na | 99.54 | 0.2317 | 0.1089 | 0 | 0.0461 | pos chrom |
| 02BWH-026 | UNKNOWN (SubPicroChromite) | 12 | 0.00 | 0.05 | 34.88 | 27.06 | 20.22 | 16.08 | 0.15 | na | na | na | 98.88 | 0.2128 | 0.1745 | 0.0474 | 0 | pos chrom |
| 02BWH-027 | PICRO_CHROMITE | 54 | 0.11 | 0.10 | 23.04 | 40.72 | 22.37 | 12.62 | 0.33 | na | na | na | 99.72 | 0.0549 | 0.1533 | 0.1002 | 0.1344 | pos chrom |
| 02BWH-027 | PICRO_CHROMITE | 55 | 0.12 | 0.91 | 18.34 | 44.63 | 18.67 | 16.48 | 0.20 | na | na | na | 99.62 | 0.1805 | 0.0915 | 0 | 0 | pos chrom |
| 02CDH-103 | Chromite | 1 | 0.07 | 0.07 | 18.19 | 50.48 | 15.72 | 15.00 | 0.19 | na | na | na | 99.95 | 0.1412 | 0.0511 | 0.0437 | 0 | pos chrom |
| 02CDH-103 | Eclogitic Garnet | 3 | 39.85 | 0.01 | 21.81 | 0.00 | 20.08 | 10.75 | 0.61 | 6.60 | 0.04 | 0.00 | 99.76 | na | na | na | na | pos eclog. |
| 02CDH-103 | Eclogitic Garnet | 4 | 40.46 | 0.04 | 22.22 | 0.00 | 18.44 | 11.70 | 0.37 | 7.06 | 0.01 | 0.00 | 100.30 | na | na | na | na | pos eclog. |
| 02CDH-103 | Pyrope | 1 | 41.81 | 0.00 | 17.73 | 7.34 | 7.84 | 18.72 | 0.47 | 6.37 | 0.03 | 0.01 | 100.32 | na | na | na | na | def pyrope |
| 02CJOH-002 | Chromite | 2 | 0.07 | 2.33 | 13.48 | 42.38 | 27.59 | 12.56 | 0.24 | na | na | na | 98.97 | 0.2047 | 0.0427 | 0 | 0.0738 | pos chro |
| 02CJOH-002 | Chromite | 3 | 0.11 | 1.40 | 23.59 | 33.56 | 26.39 | 13.82 | 0.18 | na | na | na | 99.45 | 0.2087 | 0.1202 | 0.0452 | 0.0189 | pos chro |
| 02CPH-001 | PICRO_CHROMITE | 50 | 0.07 | 1.46 | 16.89 | 41.25 | 25.09 | 13.97 | 0.26 | na | na | na | 99.33 | 0.2174 | 0.1163 | 0 | 0.0136 | pos chrom |
| 02CPH-001 | PICRO_CHROMITE | 51 | 0.00 | 0.08 | 22.91 | 45.57 | 15.65 | 15.82 | 0.24 | na | na | na | 100.54 | 0.049 | 0.1291 | 0.0462 | 0.0404 | pos chrom |
| 02CPH-001 | PICRO_CHROMITE | 52 | 0.11 | 0.07 | 25.87 | 40.89 | 16.76 | 15.38 | 0.16 | na | na | na | 99.75 | 0.114 | 0.1966 | 0.0093 | 0.1923 | pos chrom |
| 02CPH-001 | SUB_PICRO_CHROMITE | 53 | 0.09 | 0.22 | 27.99 | 38.58 | 14.16 | 18.47 | 0.18 | na | na | na | 99.99 | 0.2493 | 0 | 0.0279 | 0.0102 | pos chrom |
| 02CPH-002 | OLIVINE | 1 | 41.55 | 0.02 | 0.89 | 0.04 | 7.98 | 48.88 | 0.14 | 0.00 | na | na | 99.98 | 0.4914 | na | na | na | olivine in core of chrom |
| 02CPH-002 | PICRO_CHROMITE | 47 | 0.10 | 2.09 | 14.05 | 43.01 | 27.12 | 13.16 | 0.26 | na | na | na | 100.11 | 0.211 | 0.0658 | 0 | 0.0348 | pos chrom |
| 02CPH-002 | PICRO_CHROMITE | 48 | 0.11 | 0.08 | 26.75 | 40.00 | 18.83 | 14.34 | 0.30 | na | na | na | 100.71 | 0.0987 | 0.17 | 0 | 0.0331 | pos chrom |
| 02CPH-002 | PICRO_CHROMITE | 49 | 0.11 | 1.11 | 16.59 | 46.61 | 19.17 | 16.42 | 0.22 | na | na | na | 100.64 | 0.2447 | 0.1018 | 0 | 0.0414 | pos chrom |
| 02CPH-003 | G_10_LOW_CALCIUM_CHROME_PYROPE | 17 | 42.18 | 0.12 | 17.97 | 7.52 | 7.19 | 18.76 | 0.42 | 6.25 | 0.00 | 0.00 | 100.41 | na | na | na | na | def pyrope |
| 02HKH-001 | G_09_CHROME_PYROPE | 18 | 42.44 | 0.31 | 19.18 | 5.93 | 6.75 | 20.38 | 0.37 | 4.95 | 0.03 | 0.00 | 100.34 | na | na | na | na | def pyrope |
| 02HKH-001 | PICRO_CHROMITE | 38 | 0.06 | 0.44 | 14.62 | 47.08 | 24.56 | 12.94 | 0.26 | na | na | na | 100.15 | 0.0938 | 0.0896 | 0 | 0 | pos chrom |
| 02HKH-001 | PICRO_CHROMITE | 39 | 0.03 | 0.24 | 14.96 | 52.63 | 15.93 | 15.41 | 0.32 | na | na | na | 99.78 | 0.2248 | 0.0321 | 0 | 0 | pos chrom |
| 02HKH-001 | PICRO_CHROMITE | 41 | 0.04 | 0.17 | 19.22 | 46.22 | 20.23 | 13.46 | 0.30 | na | na | na | 99.83 | 0.0461 | 0.1069 | 0.0409 | 0 | pos chrom |
| 02HKH-001 | PICRO_CHROMITE | 42 | 0.01 | 0.08 | 12.17 | 54.98 | 20.37 | 11.84 | 0.31 | na | na | na | 100.01 | 0.0469 | 0.1613 | 0.0401 | 0 | pos chrom |
| 02HKH-001 | PICRO_CHROMITE | 43 | 0.07 | 1.01 | 17.63 | 44.48 | 20.67 | 15.62 | 0.19 | na | na | na | 99.95 | 0.2141 | 0.0633 | 0 | 0 | pos chrom |
| 02HKH-001 | PICRO_CHROMITE | 44 | 0.09 | 2.16 | 13.75 | 43.73 | 24.94 | 14.13 | 0.18 | na | na | na | 99.28 | 0.1997 | 0.0578 | 0 | 0.0508 | pos chrom |
| 02HKH-001 | PICRO_CHROMITE | 46 | 0.08 | 0.07 | 21.92 | 41.07 | 22.93 | 13.28 | 0.22 | na | na | na | 99.98 | 0.1223 | 0.2325 | 0 | 0.0505 | pos chrom |
| 02HKH-001 | SUB_PICRO_CHROMITE | 45 | 0.21 | 0.61 | 28.41 | 36.86 | 14.15 | 19.35 | 0.20 | na | na | na | 100.05 | 0.2584 | 0.0034 | 0 | 0 | pos chrom |

## 2002 Microprobe Data - Diamond Indicator Minerals - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample# | Min-id Mineral | Pt# | SiO2 | TiO2 | Al2O3 | Cr2O3 | FeO | MgO | MnO | CaO | Na2O | K2O | Total | NiO | ZnO | ZrO2 | Nb2O5 | Picked Mineral |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02HKH-001 | UNKNOWN (PicroChromite) | 40 | 0.24 | 0.10 | 10.83 | 56.59 | 15.81 | 16.26 | 0.19 | na | na | na | 100.26 | 0.1654 | 0.0927 | 0 | 0 | pos chrom |
| 02HKH-002 | PICRO_CHROMITE | 37 | 0.11 | 0.34 | 17.41 | 47.60 | 19.05 | 15.05 | 0.21 | na | na | na | 99.96 | 0.1237 | 0.0766 | 0 | 0 | pos chrom |
| 02HKH-003 | G_10_LOW_CALCIUM_CHROME_PYROPE | 23 | 41.52 | 0.02 | 17.73 | 7.59 | 6.96 | 19.49 | 0.35 | 6.59 | 0.02 | 0.00 | 100.26 | na | na | na | na | def pyrope |
| 02HKH-003 | PICRO_CHROMITE | 59 | 0.64 | 1.06 | 15.97 | 43.37 | 24.38 | 13.59 | 0.25 | na | na | na | 99.63 | 0.2077 | 0.1568 | 0 | 0 | pos chrom |
| 02HKH-003 | SUB_PICRO_CHROMITE | 60 | 0.82 | 1.51 | 19.42 | 39.37 | 22.85 | 15.09 | 0.22 | na | na | na | 99.59 | 0.2084 | 0.095 | 0.0092 | 0 | pos chrom |
| 02MDH-101 | Cr_GROSSULAR | 19 | 39.07 | 0.19 | 18.73 | 4.37 | 0.13 | 0.19 | 0.15 | 36.00 | 0.01 | 0.00 | 98.85 | na | na | na | na | pos cpx |
| 02MDH-101 | G_09_CHROME_PYROPE | 22 | 42.02 | 0.29 | 19.94 | 4.25 | 9.03 | 19.48 | 0.46 | 4.78 | 0.07 | 0.01 | 100.32 | na | na | na | na | pos pyrope |
| 02MDH-101 | G_10_LOW_CALCIUM_CHROME_PYROPE | 20 | 41.94 | 0.08 | 15.97 | 9.67 | 6.93 | 18.99 | 0.39 | 5.93 | 0.01 | 0.00 | 99.91 | na | na | na | na | def pyrope |
| 02MDH-101 | G_12_KNORRINGITIC_UVAROVITE_PYROPE | 21 | 41.02 | 0.30 | 14.45 | 12.06 | 6.48 | 18.33 | 0.34 | 6.35 | 0.04 | 0.00 | 99.38 | na | na | na | na | def pyrope |
| 02MDH-102 | G_01_TITANIAN_PYROPE | 24 | 42.36 | 0.62 | 20.70 | 2.80 | 7.48 | 21.21 | 0.27 | 4.82 | 0.04 | 0.01 | 100.31 | na | na | na | na | def pyrope |
| 02MDH-102 | G_09_CHROME_PYROPE | 25 | 41.55 | 0.05 | 20.88 | 3.36 | 8.71 | 19.56 | 0.56 | 5.14 | 0.04 | 0.01 | 99.86 | na | na | na | na | def pyrope |
| 02MDH-104 | Chromite | 5 | 0.07 | 0.46 | 6.83 | 52.69 | 24.91 | 14.18 | 0.27 | na | na | na | 99.72 | 0.1946 | 0.1049 | 0 | 0 | pos chrom |
| 02MDH-104 | Chromite | 6 | 0.11 | 3.86 | 23.39 | 25.24 | 32.41 | 14.30 | 0.22 | na | na | na | 99.79 | 0.2132 | 0.0144 | 0 | 0.0379 | pos chrom |
| 02MDH-104 | Chromite | 7 | 0.14 | 0.66 | 18.03 | 46.77 | 15.98 | 17.16 | 0.20 | na | na | na | 99.24 | 0.1984 | 0.0889 | 0 | 0 | pos chrom |
| 02MDH-104 | Chromite | 8 | 0.06 | 0.27 | 18.44 | 43.83 | 23.69 | 12.23 | 0.22 | na | na | na | 99.16 | 0.0747 | 0.1882 | 0.0207 | 0.1387 | pos chrom |
| 02MDH-104 | Chromite | 9 | 0.07 | 0.13 | 19.59 | 45.84 | 20.25 | 12.52 | 0.38 | na | na | na | 99.11 | 0.1279 | 0.105 | 0.0435 | 0.0546 | pos chrom |
| 02MDH-104 | Chromite | 10 | 0.11 | 0.63 | 10.53 | 52.05 | 20.91 | 15.60 | 0.27 | na | na | na | 100.33 | 0.2307 | 0 | 0 | 0 | pos chrom |
| 02MDH-104 | Chromite | 11 | 0.14 | 1.40 | 15.04 | 45.96 | 20.46 | 15.38 | 0.18 | na | na | na | 98.96 | 0.2322 | 0.0412 | 0.0425 | 0.0889 | pos chrom |
| 02MDH-104 | Chromite | 12 | 0.04 | 0.98 | 3.53 | 58.29 | 26.20 | 9.19 | 0.48 | na | na | na | 98.88 | 0.0729 | 0.0941 | 0 | 0 | pos chrom |
| 02MDH-104 | Chromite | 13 | 0.05 | 0.01 | 27.91 | 39.88 | 13.13 | 17.37 | 0.23 | na | na | na | 99.22 | 0.0314 | 0.6067 | 0 | 0 | pos chrom |
| 02MDH-104 | Chromite | 14 | 0.07 | 0.19 | 15.87 | 53.25 | 17.76 | 11.93 | 0.32 | na | na | na | 99.76 | 0.0579 | 0.1266 | 0 | 0.1764 | pos chrom |
| 02MDH-104 | Chromite | 15 | 0.11 | 1.28 | 15.32 | 46.25 | 19.36 | 15.59 | 0.29 | na | na | na | 98.58 | 0.2247 | 0.1095 | 0 | 0.0355 | pos chrom |
| 02MDH-104 | Chromite | 16 | 0.01 | 0.28 | 5.02 | 50.31 | 36.44 | 5.43 | 0.57 | na | na | na | 98.66 | 0.0761 | 0.4421 | 0.0815 | 0 | pos chrom |
| 02MDH-104 | Chromite | 17 | 0.07 | 0.23 | 15.96 | 46.93 | 25.32 | 10.24 | 0.34 | na | na | na | 99.46 | 0.0223 | 0.218 | 0 | 0.1379 | pos chrom |
| 02MDH-104 | Chromite | 18 | 0.15 | 1.33 | 17.75 | 42.09 | 22.19 | 15.05 | 0.23 | na | na | na | 99.13 | 0.1971 | 0.111 | 0.021 | 0 | pos chrom |
| 02MDH-104 | Chromite | 19 | 0.08 | 0.62 | 8.70 | 49.64 | 26.71 | 13.71 | 0.29 | na | na | na | 100.23 | 0.1885 | 0.0798 | 0.2046 | 0 | pos chrom |
| 02MDH-104 | Eclogitic Garnet | 5 | 40.70 | 0.02 | 21.97 | 0.08 | 14.73 | 12.54 | 0.33 | 8.95 | 0.02 | 0.00 | 99.33 | na | na | na | na | pos eclog |
| 02MDH-104 | Olivine | 1 | 41.34 | 0.02 | 1.40 | 0.02 | 9.02 | 48.16 | 0.16 | 0.02 | na | na | 100.46 | 0.3313 | na | na | na | pos olivine |
| 02MDH-104 | Picroilmenite | 4 | 0.10 | 50.49 | 0.15 | 2.04 | 32.68 | 12.74 | 0.28 | na | na | na | 99.08 | 0.0685 | 0.1385 | 0.105 | 0.2817 | pos chrom |
| 02MDH-105 | Chromite | 20 | 0.04 | 0.57 | 25.54 | 38.43 | 18.08 | 16.71 | 0.19 | na | na | na | 99.74 | 0.0827 | 0.0984 | 0 | 0 | pos chrom |
| 02MDH-105 | Chromite | 21 | 0.06 | 2.86 | 17.23 | 36.15 | 28.66 | 13.91 | 0.17 | na | na | na | 99.47 | 0.2142 | 0.1004 | 0.1274 | 0 | pos chrom |
| 02MDH-105 | Chromite | 22 | 0.09 | 0.17 | 7.65 | 53.97 | 28.80 | 7.22 | 0.35 | na | na | na | 98.58 | 0.0671 | 0.1435 | 0.1225 | 0 | pos chrom |
| 02MDH-105 | Chromite | 23 | 0.10 | 0.14 | 8.01 | 54.50 | 28.44 | 7.28 | 0.37 | na | na | na | 99.21 | 0.0843 | 0.2138 | 0.0818 | 0 | pos chrom |
| 02MDH-105 | Chromite | 24 | 0.08 | 0.36 | 8.27 | 51.78 | 24.06 | 14.61 | 0.33 | na | na | na | 99.81 | 0.1204 | 0.1163 | 0.0817 | 0 | pos chrom |
| 02MDH-105 | Chromite | 25 | 0.00 | 0.04 | 21.42 | 45.76 | 18.28 | 13.17 | 0.27 | na | na | na | 99.27 | 0.0362 | 0.1537 | 0.1489 | 0 | pos chrom |
| 02MDH-105 | Chromite | 26 | 0.07 | 0.03 | 8.70 | 60.62 | 19.31 | 10.94 | 0.30 | na | na | na | 100.35 | 0.0506 | 0.1991 | 0.1205 | 0 | pos chrom |
| 02MDH-105 | Chromite | 27 | 0.04 | 0.42 | 14.78 | 45.85 | 30.17 | 6.72 | 0.36 | na | na | na | 98.85 | 0.0873 | 0.2316 | 0.187 | 0 | pos chrom |
| 02MDH-105 | Chromite | 28 | 0.05 | 0.22 | 24.69 | 40.62 | 17.99 | 15.05 | 0.27 | na | na | na | 99.34 | 0.1332 | 0.1319 | 0.1074 | 0.0897 | pos chrom |
| 02MDH-105 | Chromite | 29 | 0.02 | 0.35 | 5.63 | 55.36 | 22.99 | 14.27 | 0.27 | na | na | na | 99.14 | 0.0661 | 0.0672 | 0.0616 | 0.0515 | pos chrom |
| 02MDH-105 | Chromite | 30 | 0.09 | 0.01 | 6.01 | 59.75 | 24.99 | 7.51 | 0.38 | na | na | na | 99.14 | 0.0026 | 0.2461 | 0.1587 | 0 | pos chrom |
| 02MDH-105 | Chromite | 31 | 0.04 | 0.01 | 16.71 | 49.05 | 22.15 | 11.04 | 0.34 | na | na | na | 99.54 | 0.0439 | 0.1572 | 0 | 0 | pos chrom |
| 02MDH-105 | Chromite | 32 | 0.08 | 1.64 | 26.24 | 29.78 | 26.02 | 14.41 | 0.14 | na | na | na | 98.82 | 0.1775 | 0.2003 | 0.1299 | 0 | pos chrom |
| 02MDH-105 | Chromite | 33 | 0.06 | 0.50 | 5.98 | 49.04 | 29.11 | 13.86 | 0.34 | na | na | na | 99.19 | 0.1977 | 0.0328 | 0 | 0.0843 | pos chrom |
| 02MDH-105 | Chromite | 34 | 0.10 | 1.42 | 13.30 | 45.63 | 28.01 | 10.17 | 0.20 | na | na | na | 99.12 | 0.1483 | 0.1042 | 0.0416 | 0 | pos chrom |
| 02MDH-105 | Chromite | 36 | 0.08 | 1.52 | 17.20 | 42.42 | 23.76 | 13.94 | 0.25 | na | na | na | 99.50 | 0.1967 | 0.1208 | 0 | 0 | pos chrom |
| 02MDH-105 | Chromite | 37 | 0.05 | 0.01 | 39.08 | 27.75 | 14.44 | 18.42 | 0.15 | na | na | na | 100.42 | 0.2436 | 0.0926 | 0.1789 | 0.0187 | pos chrom |
| 02MDH-105 | Chromite | 38 | 0.08 | 0.35 | 4.24 | 50.24 | 32.53 | 11.14 | 0.45 | na | na | na | 99.36 | 0.1419 | 0.1183 | 0 | 0.0684 | pos chrom |
| 02MDH-105 | Chromite | 39 | 0.10 | 1.20 | 14.96 | 45.46 | 24.85 | 12.30 | 0.22 | na | na | na | 99.54 | 0.2288 | 0.1149 | 0 | 0.105 | pos chrom |
| 02MDH-105 | Chromite | 40 | 0.02 | 0.05 | 8.25 | 57.04 | 25.02 | 7.84 | 0.36 | na | na | na | 98.92 | 0.0513 | 0.2036 | 0 | 0.0853 | pos chrom |
| 02MDH-105 | Chromite | 41 | 0.05 | 0.00 | 15.15 | 52.10 | 20.50 | 11.00 | 0.30 | na | na | na | 99.32 | 0.0532 | 0.1639 | 0 | 0 | pos chrom |
| 02MDH-105 | Chromite | 42 | 0.10 | 1.15 | 16.57 | 45.86 | 19.29 | 15.66 | 0.14 | na | na | na | 99.13 | 0.2537 | 0 | 0 | 0.1035 | pos chrom |
| 02MDH-105 | Chromite | 43 | 0.02 | 1.43 | 19.81 | 40.16 | 22.08 | 15.11 | 0.24 | na | na | na | 99.25 | 0.1615 | 0.0601 | 0.1251 | 0.0523 | pos chrom |
| 02MDH-105 | Picroilmenite | 35 | 0.04 | 53.13 | 0.21 | 0.95 | 30.93 | 13.17 | 0.32 | na | na | na | 99.10 | 0.0584 | 0 | 0.0972 | 0.1789 | pos chrom |
| 02MDH-105 | Picroilmenite | 44 | 0.00 | 53.71 | 0.21 | 0.93 | 31.02 | 13.50 | 0.26 | na | na | na | 100.01 | 0.069 | 0.0051 | 0.1391 | 0.1666 | pos chrom |
| 02MDH-105 | Pyrope | 6 | 42.21 | 0.13 | 20.27 | 3.99 | 7.55 | 19.75 | 0.30 | 5.02 | 0.05 | 0.00 | 99.26 | na | na | na | na | pos pyrope |
| 02MDH-106 | Eclogitic Garnet | 8 | 40.89 | 0.03 | 22.27 | 0.05 | 14.93 | 12.68 | 0.42 | 8.85 | 0.00 | 0.00 | 100.12 | na | na | na | na | pos elcog |
| 02MDH-106 | Eclogitic Garnet | 9 | 40.54 | 0.01 | 22.86 | 0.03 | 16.15 | 14.56 | 0.27 | 5.82 | 0.01 | 0.00 | 100.25 | na | na | na | na | pos elcog |
| 02MDH-106 | Pyrope | 7 | 41.93 | 0.02 | 20.56 | 3.65 | 8.40 | 18.67 | 0.54 | 5.67 | 0.02 | 0.00 | 99.46 | na | na | na | na | pos pyrope |
| 02MDH-107 | Chromite | 45 | 0.10 | 1.58 | 13.24 | 46.62 | 24.46 | 13.49 | 0.22 | na | na | na | 99.95 | 0.1599 | 0.0609 | 0 | 0.0175 | pos chrom |
| 02MDH-107 | Eclogitic Garnet | 11 | 40.62 | 0.14 | 22.41 | 0.04 | 16.57 | 12.97 | 0.22 | 7.23 | 0.01 | 0.00 | 100.22 | na | na | na | na | pos eclog |
| 02MDH-107 | Eclogitic Garnet | 12 | 40.66 | 0.09 | 22.31 | 0.13 | 14.08 | 11.26 | 0.24 | 11.59 | 0.02 | 0.00 | 100.38 | na | na | na | na | pos eclog |
| 02MDH-107 | Eclogitic Garnet | 13 | 40.37 | 0.11 | 21.68 | 0.00 | 16.16 | 11.07 | 0.35 | 9.76 | 0.00 | 0.00 | 99.50 | na | na | na | na | pos eclog |
| 02MDH-107 | Eclogitic Garnet | 14 | 40.03 | 0.05 | 21.77 | 0.15 | 18.39 | 8.97 | 0.43 | 10.59 | 0.01 | 0.00 | 100.39 | na | na | na | na | pos eclog |
| 02MDH-107 | Pyrope | 10 | 41.66 | 0.05 | 20.73 | 3.67 | 9.57 | 18.12 | 0.69 | 5.84 | 0.05 | 0.00 | 100.37 | na | na | na | na | def pyrope |
| 02WCH-003 | G_09_CHROME_PYROPE | 26 | 41.94 | 0.04 | 20.75 | 3.82 | 8.13 | 19.25 | 0.47 | 5.24 | 0.01 | 0.01 | 99.67 | na | na | na | na | def pyrope |
| 02WCH-003 | G_10_LOW_CALCIUM_CHROME_PYROPE | 27 | 42.01 | 0.13 | 19.24 | 5.67 | 7.81 | 19.06 | 0.50 | 5.21 | 0.04 | 0.00 | 99.68 | na | na | na | na | def pyrope |
| 02WCH-003 | PICRO_CHROMITE | 9 | 0.14 | 1.04 | 15.84 | 47.79 | 17.98 | 16.10 | 0.26 | na | na | na | 99.44 | 0.1641 | 0.0994 | 0.035 | 0 | pos chrom |
| 02WCH-005 | PICRO_CHROMITE | 57 | 0.00 | 2.09 | 3.73 | 50.32 | 32.00 | 8.97 | 0.43 | na | na | na | 97.93 | 0.1511 | 0.1529 | 0.0438 | 0.0384 | pos chrom |
| 02WCH-005 | PICRO_CHROMITE | 58 | 0.13 | 0.19 | 8.32 | 56.18 | 24.17 | 10.21 | 0.37 | na | na | na | 99.76 | 0.093 | 0.0976 | 0 | 0 | pos chrom |
| 02WCH-005 | SUB_PICRO_CHROMITE | 56 | 0.06 | 0.04 | 27.53 | 37.84 | 17.23 | 16.81 | 0.30 | na | na | na | 100.13 | 0.0933 | 0.1443 | 0.0648 | 0.0152 | pos chrom |

# APPENDIX 4
# 2002-2003 GEOCEHMICAL RESULTS

**SOVEREIGN MINING**
Attention: Neil Torry
PO #/Project:
Samples: 34

**Geoanalytical Laboratories SRC**
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Report No: 03-50
Date: February 12, 2003

Column Header Details

Ag by ICP in ppm (Ag)
Al2O3 by ICP in wt % (Al2O3)
As by ICP in ppm (As)
Ba by ICP in ppm (Ba)
Be by ICP in ppm (Be)

Bi by ICP in ppm (Bi)
CaO by ICP in wt % (CaO)
Cd by ICP in ppm (Cd)
Co by ICP in ppm (Co)
Cr by ICP in ppm (Cr)

Cu by ICP in ppm (Cu)
Fe2O2 by ICP in wt % (Fe2O3)
K2O by ICP in wt % (K2O)
MgO by ICP in wt % (MgO)
MnO by ICP in wt % (MnO)

Mo by ICP in ppm (Mo)
Na2O by ICP in wt % (Na2O)
Ni by ICP in ppm (Ni)
P2O5 by ICP in wt % (P2O5)
Pb by ICP in ppm (Pb)

Sb by ICP in ppm (Sb)
Sc by ICP in ppm (Sc)
Sn by ICP in ppm (Sn)
Sr by ICP in ppm (Sr)
TiO2 by ICP in wt % (TiO2)

V by ICP in ppm (V)
W by ICP in ppm (W)
Y by ICP in ppm (Y)
Zn by ICP in ppm (Zn)
Zr by ICP in ppm (Zr)

Gold by Fire Assay ICP in ppb (Au)
Gold by Fire Assay ICP Repeat in ppb (Au R)

**Geoanalytical Laboratories SRC**
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**SOVEREIGN MINING**
Attention: Neil Torry
PO #/Project:
Samples: 34

Report No: 03-50
Date: February 12, 2003

| Sample Number | Ag ppm | Al2O3 wt % | As ppm | Ba ppm | Be ppm | Bi ppm | CaO wt % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe2O3 wt % | K2O wt % | MgO wt % | MnO wt % | Mo ppm | Na2O wt % | Ni ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC1 | <0.2 | 5.67 | 10 | 295 | 1.9 | <1 | 0.48 | 1 | 38 | 72 | 48 | 10.7 | 0.47 | 1.09 | 0.602 | 17 | 0.02 | 50 |
| 02BWS 1 | <0.2 | 1.43 | 4 | 177 | <0.5 | <1 | 0.68 | <1 | 6 | 11 | 9 | 1.44 | 0.05 | 0.38 | 0.042 | <1 | 0.01 | 12 |
| 02BWS 2 | <0.2 | 1.26 | 6 | 164 | 0.5 | <1 | 1.42 | <1 | 9 | 12 | 14 | 2.22 | 0.09 | 0.73 | 0.041 | <1 | 0.01 | 20 |
| 02BWS 3 | <0.2 | 0.91 | 4 | 115 | <0.5 | <1 | 0.61 | <1 | 5 | 8 | 8 | 1.66 | 0.05 | 0.45 | 0.028 | <1 | 0.01 | 11 |
| 02BWS 4 | <0.2 | 1.19 | 3 | 156 | 0.5 | <1 | 0.48 | <1 | 6 | 11 | 11 | 1.75 | 0.06 | 0.38 | 0.028 | <1 | 0.04 | 15 |
| 02BWS 5 | <0.2 | 0.91 | 4 | 159 | 0.5 | <1 | 0.61 | <1 | 10 | 10 | 9 | 2.15 | 0.05 | 0.37 | 0.082 | <1 | 0.02 | 16 |
| 02BWS 6 | <0.2 | 1.41 | 8 | 198 | 0.7 | <1 | 1.58 | <1 | 9 | 13 | 23 | 2.72 | 0.12 | 0.83 | 0.073 | 1 | 0.02 | 27 |
| 02BWS 7 | <0.2 | 0.95 | 3 | 147 | <0.5 | <1 | 0.44 | <1 | 7 | 10 | 9 | 1.68 | 0.06 | 0.37 | 0.036 | <1 | 0.01 | 14 |
| 02BWS 8 | <0.2 | 1.65 | 6 | 197 | 0.7 | <1 | 0.97 | <1 | 11 | 16 | 24 | 3.61 | 0.11 | 0.71 | 0.054 | <1 | 0.02 | 29 |
| 02BWS 9 | <0.2 | 1.22 | 2 | 134 | <0.5 | <1 | 0.49 | <1 | 5 | 12 | 9 | 1.53 | 0.05 | 0.44 | 0.023 | <1 | 0.01 | 13 |
| 02BWS 10 | <0.2 | 0.91 | 3 | 132 | <0.5 | <1 | 0.56 | <1 | 6 | 9 | 9 | 1.51 | 0.05 | 0.41 | 0.021 | <1 | 0.01 | 14 |
| 02BWS 11 | <0.2 | 1.37 | 8 | 331 | 0.6 | <1 | 1.65 | <1 | 8 | 13 | 20 | 2.51 | 0.12 | 0.87 | 0.035 | 1 | 0.01 | 23 |
| 02BWS 12 | <0.2 | 1.52 | 6 | 206 | 0.6 | <1 | 2.03 | <1 | 8 | 14 | 22 | 2.49 | 0.13 | 0.95 | 0.041 | 1 | 0.02 | 23 |
| 02BWS 13 | <0.2 | 1.66 | 3 | 158 | 0.5 | <1 | 0.53 | <1 | 6 | 14 | 10 | 2.68 | 0.11 | 0.48 | 0.022 | <1 | 0.01 | 14 |
| 02BWS 14 | <0.2 | 0.68 | 3 | 121 | <0.5 | <1 | 0.53 | <1 | 6 | 8 | 7 | 1.49 | 0.05 | 0.37 | 0.024 | <1 | 0.01 | 12 |
| 02BWS 15 | <0.2 | 1.05 | 4 | 160 | 0.5 | <1 | 0.58 | <1 | 8 | 10 | 13 | 1.61 | 0.08 | 0.41 | 0.039 | <1 | 0.03 | 17 |
| 02BWS 16 | <0.2 | 1.06 | 4 | 189 | 0.5 | <1 | 0.63 | <1 | 8 | 10 | 14 | 1.94 | 0.09 | 0.46 | 0.032 | <1 | 0.02 | 19 |
| 02BWS 17 | <0.2 | 1.31 | 6 | 139 | 0.6 | <1 | 0.57 | <1 | 6 | 12 | 12 | 2.31 | 0.09 | 0.41 | 0.025 | <1 | 0.01 | 15 |
| 02BWS 18 | <0.2 | 1.15 | 3 | 125 | <0.5 | <1 | 0.61 | <1 | 7 | 9 | 9 | 1.65 | 0.05 | 0.36 | 0.027 | <1 | 0.01 | 13 |
| 02BWS 19 | <0.2 | 1.12 | 4 | 131 | 0.5 | <1 | 0.61 | <1 | 7 | 9 | 9 | 1.53 | 0.05 | 0.37 | 0.036 | <1 | 0.02 | 12 |
| QC2 | <0.2 | 5.77 | 10 | 308 | 1.9 | <1 | 0.49 | 1 | 39 | 70 | 49 | 11.1 | 0.49 | 1.11 | 0.631 | 18 | 0.02 | 50 |
| 02BWS 20 | <0.2 | 0.91 | 4 | 142 | <0.5 | <1 | 0.73 | <1 | 6 | 9 | 9 | 1.47 | 0.07 | 0.51 | 0.031 | <1 | 0.02 | 14 |
| 02BWS 21 | <0.2 | 1.52 | 4 | 175 | 0.5 | <1 | 0.72 | <1 | 7 | 13 | 14 | 1.83 | 0.11 | 0.49 | 0.032 | <1 | 0.01 | 16 |
| 02CPS 1 | <0.2 | 1.51 | 5 | 202 | <0.5 | <1 | 1.03 | <1 | 8 | 14 | 11 | 2.15 | 0.08 | 0.68 | 0.076 | <1 | 0.01 | 18 |
| 02CPS 2 | 0.2 | 2.02 | 7 | 262 | 0.6 | <1 | 1.26 | <1 | 10 | 18 | 21 | 2.87 | 0.12 | 0.86 | 0.085 | <1 | 0.02 | 27 |
| 02CPS 3 | <0.2 | 1.91 | 5 | 194 | 0.6 | <1 | 0.71 | <1 | 8 | 15 | 12 | 2.63 | 0.08 | 0.59 | 0.038 | <1 | 0.01 | 19 |
| 02CPS 4 | <0.2 | 1.86 | 6 | 198 | 0.5 | <1 | 0.73 | <1 | 9 | 13 | 11 | 2.44 | 0.08 | 0.52 | 0.061 | <1 | 0.01 | 16 |
| 02HKS 1 | <0.2 | 1.55 | 3 | 192 | <0.5 | <1 | 0.61 | <1 | 5 | 14 | 9 | 1.56 | 0.06 | 0.52 | 0.012 | <1 | 0.02 | 16 |
| 02HKS 2 | <0.2 | 1.54 | 5 | 190 | <0.5 | <1 | 0.65 | <1 | 7 | 12 | 11 | 2.06 | 0.08 | 0.53 | 0.039 | <1 | 0.01 | 16 |
| 02HKS 3 | <0.2 | 1.65 | 3 | 210 | 0.5 | <1 | 0.73 | <1 | 9 | 13 | 11 | 2.03 | 0.08 | 0.55 | 0.028 | <1 | 0.02 | 18 |
| 02WCS 1 | <0.2 | 0.89 | 4 | 139 | <0.5 | <1 | 1.21 | <1 | 6 | 10 | 8 | 1.87 | 0.06 | 0.75 | 0.044 | <1 | 0.01 | 14 |
| 02WCS 2 | <0.2 | 1.32 | 4 | 145 | <0.5 | <1 | 0.87 | <1 | 7 | 12 | 10 | 2.06 | 0.07 | 0.61 | 0.041 | <1 | 0.01 | 14 |
| 02WCS 3 | <0.2 | 1.32 | 7 | 169 | <0.5 | <1 | 1.29 | <1 | 9 | 14 | 10 | 2.81 | 0.08 | 0.71 | 0.089 | <1 | 0.01 | 20 |
| 02CPS 3R | <0.2 | 1.84 | 5 | 194 | 0.6 | <1 | 0.71 | <1 | 8 | 15 | 13 | 2.63 | 0.08 | 0.59 | 0.039 | <1 | 0.01 | 19 |

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**SOVEREIGN MINING**
Attention: Neil Torry
PO #/Project:
Samples: 34

Report No: 03-50
Date: February 12, 2003

| Sample Number | P2O5 wt % | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | TiO2 wt % | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm | Au ppb | Au R ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC1 | 0.529 | 16 | <1 | 5 | <1 | 24 | 0.14 | 98 | <1 | 16 | 194 | <1 | N/R | N/R |
| 02BWS 1 | 0.102 | 8 | <1 | 1 | <1 | 36 | 0.01 | 17 | <1 | 6 | 54 | 1 | 59 | 25 |
| 02BWS 2 | 0.112 | 9 | <1 | 2 | <1 | 27 | 0.01 | 22 | <1 | 8 | 58 | 4 | 19 | N/R |
| 02BWS 3 | 0.109 | 8 | <1 | 1 | <1 | 25 | 0.02 | 15 | <1 | 7 | 39 | 3 | 280 | 7 |
| 02BWS 4 | 0.096 | 10 | <1 | 2 | <1 | 30 | 0.01 | 19 | <1 | 9 | 46 | 4 | 19 | N/R |
| 02BWS 5 | 0.111 | 8 | <1 | 1 | <1 | 28 | 0.03 | 19 | <1 | 9 | 43 | 5 | 13 | N/R |
| 02BWS 6 | 0.114 | 12 | <1 | 3 | <1 | 47 | 0.02 | 23 | <1 | 12 | 64 | 9 | 15 | N/R |
| 02BWS 7 | 0.103 | 7 | <1 | 1 | <1 | 25 | 0.02 | 17 | <1 | 7 | 40 | 3 | 5 | N/R |
| 02BWS 8 | 0.119 | 13 | <1 | 4 | <1 | 34 | 0.02 | 27 | <1 | 12 | 70 | 6 | 867 | 8 |
| 02BWS 9 | 0.092 | 8 | <1 | 1 | <1 | 27 | 0.01 | 19 | <1 | 6 | 53 | 1 | 16 | N/R |
| 02BWS 10 | 0.105 | 7 | <1 | 1 | <1 | 23 | 0.01 | 15 | <1 | 7 | 47 | 3 | 5 | N/R |
| 02BWS 11 | 0.126 | 11 | <1 | 3 | <1 | 46 | 0.01 | 24 | <1 | 11 | 65 | 5 | 18 | N/R |
| 02BWS 12 | 0.133 | 11 | <1 | 3 | <1 | 46 | 0.01 | 25 | <1 | 12 | 74 | 6 | 5 | N/R |
| 02BWS 13 | 0.126 | 9 | <1 | 2 | <1 | 31 | 0.01 | 24 | <1 | 7 | 56 | 2 | 7 | N/R |
| 02BWS 14 | 0.098 | 6 | <1 | 1 | <1 | 19 | 0.02 | 15 | <1 | 6 | 43 | 3 | 5 | N/R |
| 02BWS 15 | 0.085 | 9 | <1 | 2 | <1 | 28 | 0.02 | 17 | <1 | 10 | 52 | 4 | 18 | N/R |
| 02BWS 16 | 0.097 | 10 | <1 | 2 | <1 | 31 | 0.02 | 18 | <1 | 9 | 59 | 4 | 17 | N/R |
| 02BWS 17 | 0.116 | 10 | <1 | 2 | <1 | 30 | 0.01 | 21 | <1 | 9 | 57 | 3 | 106 | 2 |
| 02BWS 18 | 0.089 | 9 | <1 | 1 | <1 | 27 | 0.01 | 16 | <1 | 7 | 49 | 1 | 7 | N/R |
| 02BWS 19 | 0.081 | 11 | <1 | 1 | <1 | 29 | 0.01 | 16 | <1 | 7 | 43 | 3 | 2 | N/R |
| QC2 | 0.535 | 16 | <1 | 6 | <1 | 25 | 0.15 | 99 | <1 | 16 | 200 | <1 | N/R | N/R |
| 02BWS 20 | 0.091 | 7 | <1 | 1 | <1 | 26 | 0.01 | 14 | <1 | 8 | 45 | 5 | 2 | N/R |
| 02BWS 21 | 0.082 | 9 | <1 | 2 | <1 | 31 | 0.01 | 22 | <1 | 8 | 56 | 1 | 3 | N/R |
| 02CPS 1 | 0.115 | 8 | <1 | 2 | <1 | 31 | 0.02 | 22 | <1 | 8 | 56 | 3 | 5 | N/R |
| 02CPS 2 | 0.127 | 11 | <1 | 3 | <1 | 45 | 0.02 | 30 | <1 | 12 | 67 | 5 | 5 | N/R |
| 02CPS 3 | 0.117 | 10 | <1 | 2 | <1 | 31 | 0.01 | 25 | <1 | 10 | 59 | 1 | 4 | N/R |
| 02CPS 4 | 0.118 | 11 | <1 | 1 | <1 | 31 | <0.01 | 25 | <1 | 8 | 70 | <1 | 10 | N/R |
| 02HKS 1 | 0.098 | 8 | <1 | 2 | <1 | 28 | 0.02 | 21 | <1 | 7 | 61 | 3 | 1030 | 27 |
| 02HKS 2 | 0.112 | 9 | <1 | 2 | <1 | 30 | 0.01 | 21 | <1 | 7 | 57 | 1 | 3 | N/R |
| 02HKS 3 | 0.104 | 10 | <1 | 2 | <1 | 35 | 0.01 | 21 | <1 | 8 | 67 | 2 | 22 | N/R |
| 02WCS 1 | 0.141 | 6 | <1 | 1 | <1 | 25 | 0.01 | 17 | <1 | 8 | 43 | 2 | 9 | N/R |
| 02WCS 2 | 0.111 | 9 | <1 | 2 | <1 | 33 | 0.01 | 18 | <1 | 7 | 61 | 2 | 3 | N/R |
| 02WCS 3 | 0.126 | 9 | <1 | 2 | <1 | 36 | 0.01 | 24 | <1 | 8 | 55 | 3 | 15 | N/R |
| 02CPS 3R | 0.115 | 10 | <1 | 2 | <1 | 31 | 0.01 | 24 | <1 | 10 | 60 | 1 | 11 | N/R |

Standards QC1 and QC2 are LS3
Fire Assay: A 30 g pulp is subjected to standard fire assaying proceedures
Aqua Regia: A 0.5 g pulp is digested with 2.00 ml of 3:1 HCL:HNO3 for 1 hour at 95 C.

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:
Samples: 33

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Report No: 04-91
Date: March 02, 2004

## ICP Whole Rock Assay
Lithium Metaborate Fusion

Column Header Details

Al2O3 by ICP in wt % (Al2O3)
CaO by ICP in wt % (CaO)
Fe2O3 by ICP in wt % (Fe2O3)
K2O by ICP in wt % (K2O)
MgO by ICP in wt % (MgO)

MnO by ICP in wt % (MnO)
Na2O by ICP in wt % (Na2O)
P2O5 by ICP in wt % (P2O5)
TiO2 by ICP in wt % (TiO2)
SiO2 by ICP in wt % (SiO2)

| Sample Number | Al2O3 wt % | CaO wt % | Fe2O3 wt % | K2O wt % | MgO wt % | MnO wt % | Na2O wt % | P2O5 wt % | TiO2 wt % | SiO2 wt % |
|---|---|---|---|---|---|---|---|---|---|---|
| MRG1 | 8.36 | 14.3 | 17.5 | 0.21 | 13.2 | 0.16 | 0.71 | 0.06 | 3.65 | 39.4 |
| P-03-01-001 | 14.0 | 1.58 | 3.91 | 2.44 | 1.64 | 0.03 | 1.21 | 0.03 | 0.41 | 65.8 |
| P-03-01-002 | 15.7 | 2.54 | 6.08 | 1.06 | 2.28 | 0.02 | 0.99 | 0.12 | 0.48 | 64.9 |
| P-03-01-003 | 15.5 | 2.01 | 6.50 | 1.14 | 2.54 | 0.03 | 0.74 | 0.07 | 0.49 | 63.1 |
| P-03-02-001 | 16.8 | 0.88 | 4.11 | 2.75 | 1.01 | <0.01 | 1.18 | 0.02 | 0.70 | 67.4 |
| P-03-02-002 | 16.6 | 0.67 | 3.08 | 3.91 | 1.42 | 0.02 | 1.26 | 0.08 | 0.78 | 66.4 |
| P-03-02-003 | 15.7 | 0.89 | 5.58 | 3.67 | 1.07 | 0.02 | 1.03 | 0.03 | 0.70 | 64.7 |
| P-03-02-004 | 15.6 | 0.65 | 2.87 | 3.08 | 0.79 | 0.01 | 1.23 | 0.03 | 0.74 | 68.2 |
| P-03-02-005 | 19.2 | 0.78 | 2.41 | 1.75 | 0.58 | <0.01 | 0.61 | 0.01 | 0.77 | 66.9 |
| P-03-02-006 | 17.3 | 1.03 | 5.21 | 3.37 | 1.21 | 0.01 | 0.83 | 0.09 | 0.73 | 63.7 |
| P-03-03-001 | 14.2 | 1.61 | 4.61 | 2.34 | 1.51 | 0.03 | 1.20 | 0.04 | 0.39 | 66.2 |
| P-03-03-002 | 13.7 | 1.53 | 3.81 | 2.59 | 1.33 | 0.03 | 1.34 | 0.03 | 0.36 | 64.7 |
| P-03-03-003 | 15.0 | 1.91 | 7.19 | 1.20 | 2.04 | 0.03 | 0.77 | 0.03 | 0.41 | 60.0 |
| P-03-03-004 | 13.1 | 1.45 | 3.32 | 2.83 | 1.14 | 0.03 | 1.57 | 0.05 | 0.40 | 67.8 |
| P-03-04-001 | 16.5 | 1.87 | 5.60 | 1.65 | 2.67 | 0.03 | 0.53 | 0.03 | 0.56 | 64.5 |
| P-03-04-002 | 13.0 | 1.22 | 2.15 | 3.54 | 0.58 | 0.03 | 1.94 | 0.02 | 0.18 | 68.2 |
| P-03-04-003 | 11.9 | 1.89 | 2.54 | 2.08 | 0.70 | 0.03 | 1.40 | 0.06 | 0.32 | 65.8 |
| P-03-05-001 | 13.6 | 3.27 | 3.99 | 2.49 | 1.72 | 0.06 | 2.06 | 0.10 | 0.62 | 66.0 |
| P-03-06-001 | 14.9 | 1.09 | 5.10 | 1.58 | 0.82 | <0.01 | 0.93 | 0.03 | 0.61 | 67.1 |
| P-03-06-002 | 17.8 | 0.88 | 2.77 | 2.00 | 0.83 | <0.01 | 0.92 | <0.01 | 0.78 | 67.1 |
| MRG1 | 8.35 | 14.3 | 18.0 | 0.23 | 13.3 | 0.16 | 0.69 | 0.05 | 3.65 | 40.0 |
| P-03-06-003 | 16.9 | 0.76 | 2.10 | 1.55 | 0.64 | <0.01 | 0.81 | 0.01 | 0.49 | 69.2 |
| P-03-07-001 | 12.7 | 3.29 | 2.84 | 2.14 | 1.61 | 0.03 | 2.17 | 0.10 | 0.54 | 68.1 |
| P-03-07-002 | 13.7 | 2.47 | 4.72 | 2.37 | 1.94 | 0.02 | 1.71 | 0.12 | 0.65 | 66.9 |
| P-03-07-003 | 14.2 | 1.89 | 3.90 | 2.09 | 1.09 | 0.04 | 1.50 | 0.07 | 0.36 | 67.5 |
| P-03-07-004 | 17.2 | 2.18 | 5.80 | 0.91 | 2.23 | 0.03 | 0.83 | 0.02 | 0.39 | 62.9 |

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:
Samples: 33

Report No: 04-91
Date: March 02, 2004

## ICP Whole Rock Assay

Lithium Metaborate Fusion

| Sample Number | Al2O3 wt % | CaO wt % | Fe2O3 wt % | K2O wt % | MgO wt % | MnO wt % | Na2O wt % | P2O5 wt % | TiO2 wt % | SiO2 wt % |
|---|---|---|---|---|---|---|---|---|---|---|
| P-03-07-005 | 14.9 | 2.71 | 5.77 | 2.87 | 2.29 | 0.43 | 1.59 | 0.13 | 0.71 | 61.4 |
| T-03-01-001 | 14.7 | 1.66 | 5.89 | 1.09 | 1.38 | 0.03 | 0.59 | <0.01 | 0.41 | 66.8 |
| T-03-01-002 | 14.2 | 1.67 | 2.91 | 2.03 | 0.70 | 0.03 | 1.53 | 0.03 | 0.35 | 66.8 |
| T-03-01-003 | 14.9 | 1.62 | 3.50 | 2.65 | 1.28 | 0.03 | 1.40 | 0.05 | 0.34 | 66.0 |
| T-03-01-004 | 13.2 | 1.38 | 3.42 | 2.71 | 1.23 | 0.03 | 1.41 | 0.05 | 0.37 | 67.2 |
| T-03-01-005 | 14.1 | 1.78 | 5.14 | 2.04 | 1.76 | 0.03 | 1.17 | 0.06 | 0.39 | 66.1 |
| P-03-01-002 R | 15.0 | 2.40 | 6.01 | 1.05 | 2.22 | 0.02 | 0.95 | 0.12 | 0.46 | 65.2 |

Whole Rock Analysis: A 0.1 gram pulp is fused at 1000 C with lithium metaborate then dissolved in dilute HNO3.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:
Samples: 33

Report No: 04-91
Date: March 02, 2004

# ICP Whole Rock Assay

Lithium Metaborate Fusion

Column Header Details

Ba by ICP in ppm (Ba)
Cr by ICP in ppm (Cr)
Sc by ICP in ppm (Sc)
Sr by ICP in ppm (Sr)
Y by ICP in ppm (Y)

Zr by ICP in ppm (Zr)
Loss on Ignition in wt % (LOI)
SUM (SUM)

| Sample Number | Ba ppm | Cr ppm | Sc ppm | Sr ppm | Y ppm | Zr ppm | LOI wt % | SUM |
|---|---|---|---|---|---|---|---|---|
| MRG1 | 44 | 434 | 53 | 261 | 13 | 93 | N/R | 97.55 |
| P-03-01-001 | 1020 | 96 | 6 | 149 | 21 | 154 | 7.8 | 98.85 |
| P-03-01-002 | 1130 | 159 | 6 | 217 | 24 | 210 | 6.0 | 100.17 |
| P-03-01-003 | 638 | 226 | 8 | 149 | 24 | 179 | 7.1 | 99.21 |
| P-03-02-001 | 663 | 172 | 16 | 137 | 24 | 150 | 5.4 | 100.25 |
| P-03-02-002 | 915 | 275 | 16 | 119 | 26 | 135 | 5.2 | 99.42 |
| P-03-02-003 | 977 | 154 | 17 | 118 | 27 | 121 | 5.0 | 98.39 |
| P-03-02-004 | 821 | 130 | 16 | 118 | 36 | 147 | 4.7 | 97.89 |
| P-03-02-005 | 553 | 157 | 11 | 83 | 15 | 225 | 7.1 | 100.11 |
| P-03-02-006 | 736 | 182 | 19 | 116 | 26 | 131 | 5.8 | 99.28 |
| P-03-03-001 | 964 | 167 | 6 | 155 | 22 | 151 | 7.1 | 99.23 |
| P-03-03-002 | 1080 | 77 | 5 | 156 | 18 | 152 | 9.5 | 98.92 |
| P-03-03-003 | 677 | 176 | 6 | 137 | 20 | 171 | 11.4 | 99.98 |
| P-03-03-004 | 1180 | 41 | 5 | 170 | 22 | 149 | 6.7 | 98.39 |
| P-03-04-001 | 1100 | 71 | 7 | 120 | 19 | 165 | 8.0 | 101.94 |
| P-03-04-002 | 684 | 95 | 3 | 108 | 25 | 182 | 8.6 | 99.46 |
| P-03-04-003 | 850 | 163 | 7 | 169 | 43 | 204 | 12.6 | 99.32 |
| P-03-05-001 | 1570 | 125 | 14 | 350 | 20 | 176 | 5.8 | 99.71 |
| P-03-06-001 | 531 | 119 | 12 | 121 | 61 | 148 | 5.9 | 98.06 |
| P-03-06-002 | 570 | 113 | 13 | 105 | 11 | 173 | 6.3 | 99.38 |
| MRG1 | 44 | 459 | 54 | 263 | 14 | 98 | N/R | 98.73 |
| P-03-06-003 | 657 | 70 | 9 | 97 | 9 | 134 | 5.9 | 98.36 |
| P-03-07-001 | 1190 | 147 | 10 | 343 | 19 | 166 | 5.3 | 98.82 |
| P-03-07-002 | 771 | 190 | 13 | 241 | 25 | 141 | 5.1 | 99.70 |
| P-03-07-003 | 773 | 166 | 4 | 185 | 25 | 143 | 7.6 | 100.24 |
| P-03-07-004 | 499 | 508 | 5 | 186 | 18 | 158 | 7.0 | 99.49 |
| P-03-07-005 | 812 | 261 | 15 | 228 | 24 | 120 | 6.2 | 99.00 |
| T-03-01-001 | 364 | 61 | 8 | 147 | 14 | 166 | 6.3 | 98.85 |
| T-03-01-002 | 767 | 46 | 6 | 174 | 28 | 180 | 8.3 | 98.55 |

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:
Samples: 33

Report No: 04-91
Date: March 02, 2004

## ICP Whole Rock Assay

Lithium Metaborate Fusion

| Sample Number | Ba ppm | Cr ppm | Sc ppm | Sr ppm | Y ppm | Zr ppm | LOI wt % | SUM |
|---|---|---|---|---|---|---|---|---|
| T-03-01-003 | 952 | 77 | 5 | 142 | 20 | 129 | 6.7 | 98.46 |
| T-03-01-004 | 1060 | 159 | 5 | 162 | 21 | 146 | 7.1 | 98.10 |
| T-03-01-005 | 874 | 49 | 6 | 162 | 21 | 160 | 6.6 | 99.17 |
| P-03-01-002 R | 1060 | 82 | 6 | 208 | 23 | 205 | 6.1 | 99.53 |

Whole Rock Analysis: A 0.1 gram pulp is fused at 1000 C with lithium metaborate then dissolved in dilute HNO3.

# APPENDIX 5
# 2002-2003 GOLD GRAIN RESULTS

## 2002-2003 Compiled Gold Grain Results From Pan HMC Samples - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | utmx_n27 | utmy_n27 | Sample Type | Sample Weight(kg) | Grains Picked | Grains Est. | Estimated Weight of Au (um) | (um)corr | mg | g | Factor wt to 1000kg | Grade grams/ tonne (ppm) | Grade oz/ ton | Estimated Conc. ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02BWH001 | 543192 | 6034194 | Pan HMC | 6.50 | 0 | 0 | 0 | 0 | 0 | 0 | 153.84615 | 0.00000 | 0.00000 | **0.0** |
| 02BWH002 | 541234 | 6031587 | Beach HMC | 10.20 | 4 | 4 | 12.29 | 12.29 | 0.01229 | 0.00001229 | 98.039216 | 0.00120 | 0.00004 | **1.2** |
| 02BWH003 | 512565 | 6034805 | Beach HMC | 17.50 | 20 | 20 | 52.67 | 52.67 | 0.05267 | 0.00005267 | 57.142857 | 0.00301 | 0.00009 | **3.0** |
| 02BWH004 | 512510 | 6034574 | Pan HMC | 15.80 | 1 | 1 | 0.71 | 0.71 | 0.00071 | 0.00000071 | 63.291139 | 0.00004 | 0.00000 | **0.0** |
| 02BWH005 | 511549 | 6107259 | Pan HMC | 8.80 | 6 | 6 | 15.83 | 15.83 | 0.01583 | 0.00001583 | 113.63636 | 0.00180 | 0.00005 | **1.8** |
| 02BWH006 | 517684 | 6108161 | Pan HMC | 7.10 | 14 | 14 | 46.93 | 46.93 | 0.04693 | 0.00004693 | 140.84507 | 0.00661 | 0.00019 | **6.6** |
| 02BWH007 | 523913 | 6077223 | Pan HMC | 5.25 | 6 | 6 | 15.03 | 15.03 | 0.01503 | 0.00001503 | 190.47619 | 0.00286 | 0.00008 | **2.9** |
| 02BWH008 | 521778 | 6076871 | Pan HMC | 5.15 | 6 | 6 | 224.78 | 224.78 | 0.22478 | 0.00022478 | 194.17476 | 0.04365 | 0.00127 | **43.6** |
| 02BWH009 | 521125 | 6076909 | Pan HMC | 9.85 | 0 | 0 | 0 | 0 | 0 | 0 | 101.52284 | 0.00000 | 0.00000 | **0.0** |
| 02BWH010 | 520804 | 6080359 | Pan HMC | 6.70 | 17 | 17 | 361.83 | 361.83 | 0.36183 | 0.00036183 | 149.25373 | 0.05400 | 0.00158 | **54.0** |
| 02BWH011 | 521736 | 6080478 | Pan HMC | 7.60 | 3 | 3 | 23.87 | 23.87 | 0.02387 | 0.00002387 | 131.57895 | 0.00314 | 0.00009 | **3.1** |
| 02BWH012 | 521697 | 6080407 | Pan HMC | 10.80 | 7 | 7 | 18.52 | 18.52 | 0.01852 | 0.00001852 | 92.592593 | 0.00171 | 0.00005 | **1.7** |
| 02BWH013 | 519860 | 6083018 | Pan HMC | 7.25 | 18 | 18 | 166.72 | 166.72 | 0.16672 | 0.00016672 | 137.93103 | 0.02300 | 0.00067 | **23.0** |
| 02BWH014 | 521447 | 6071161 | Pan HMC | 8.00 | 14 | 14 | 89.83 | 89.83 | 0.08983 | 0.00008983 | 125 | 0.01123 | 0.00033 | **11.2** |
| 02BWH015 | 517447 | 6070996 | Pan HMC | 7.95 | 17 | 17 | 291.83 | 291.83 | 0.29183 | 0.00029183 | 125.78616 | 0.03671 | 0.00107 | **36.7** |
| 02BWH016 | 512938 | 6071389 | Pan HMC | 6.70 | 5 | 5 | 59.64 | 59.64 | 0.05964 | 0.00005964 | 149.25373 | 0.00890 | 0.00026 | **8.9** |
| 02BWH017 | 513387 | 6070512 | Pan HMC | 3.90 | 5 | 5 | 35.84 | 35.84 | 0.03584 | 0.00003584 | 256.41026 | 0.00919 | 0.00027 | **9.2** |
| 02BWH018 | 524032 | 6105754 | Pan HMC | 8.10 | 1 | 1 | 6 | 6 | 0.006 | 0.000006 | 123.45679 | 0.00074 | 0.00002 | **0.7** |
| 02BWH019 | 524851 | 6104069 | Pan HMC | 7.60 | 6 | 6 | 213.13 | 213.13 | 0.21313 | 0.00021313 | 131.57895 | 0.02804 | 0.00082 | **28.0** |
| 02BWH020 | 521781 | 6097986 | Pan HMC | 3.95 | 8 | 8 | 15.29 | 15.29 | 0.01529 | 0.00001529 | 253.16456 | 0.00387 | 0.00011 | **3.9** |
| 02BWH021 | 522229 | 6101511 | Pan HMC | 6.10 | 4 | 4 | 18.04 | 18.04 | 0.01804 | 0.00001804 | 163.93443 | 0.00296 | 0.00009 | **3.0** |
| 02BWH022 | 537266 | 6083335 | Pan HMC | 6.85 | 3 | 3 | 9.17 | 9.17 | 0.00917 | 0.00000917 | 145.9854 | 0.00134 | 0.00004 | **1.3** |
| 02BWH023 | 536301 | 6080230 | Pan HMC | 9.40 | 14 | 14 | 371.68 | 371.68 | 0.37168 | 0.00037168 | 106.38298 | 0.03954 | 0.00115 | **39.5** |
| 02BWH024 | 533345 | 6086447 | Pan HMC | 4.60 | 18 | 18 | 142.4 | 142.4 | 0.1424 | 0.0001424 | 217.3913 | 0.03096 | 0.00090 | **31.0** |
| 02BWH025 | 533462 | 6084326 | Pan HMC | 7.10 | 2 | 2 | 10.97 | 10.97 | 0.01097 | 0.00001097 | 140.84507 | 0.00155 | 0.00005 | **1.5** |
| 02BWH026 | 541766 | 6089963 | Pan HMC | 16.25 | 21 | 21 | 61.04 | 61.04 | 0.06104 | 0.00006104 | 61.538462 | 0.00376 | 0.00011 | **3.8** |
| 02BWH027 | 531896 | 6092778 | Pan HMC | 11.70 | 4 | 4 | 20.7 | 20.7 | 0.0207 | 0.0000207 | 85.470085 | 0.00177 | 0.00005 | **1.8** |
| 02CPH001 | 555745 | 6034004 | Pan HMC | 7.80 | 8 | 8 | 30.41 | 30.41 | 0.03041 | 0.00003041 | 128.20513 | 0.00390 | 0.00011 | **3.9** |
| 02CPH002 | 556848 | 6033502 | Pan HMC | 16.65 | 3 | 3 | 5.38 | 5.38 | 0.00538 | 0.00000538 | 60.06006 | 0.00032 | 0.00001 | **0.3** |
| 02CPH003 | 537272 | 6040839 | Pan HMC | 18.80 | 8 | 8 | 111.08 | 111.08 | 0.11108 | 0.00011108 | 53.191489 | 0.00591 | 0.00017 | **5.9** |
| 02CPH004 | 534606 | 6040594 | Pan HMC | 18.35 | 6 | 6 | 37.42 | 37.42 | 0.03742 | 0.00003742 | 54.495913 | 0.00204 | 0.00006 | **2.0** |
| 02HKH001 | 555977 | 6031735 | Pan HMC | 9.60 | 29 | 29 | 112.38 | 112.38 | 0.11238 | 0.00011238 | 104.16667 | 0.01171 | 0.00034 | **11.7** |
| 02HKH002 | 539711 | 6039312 | Pan HMC | 7.30 | 1 | 1 | 9.85 | 9.85 | 0.00985 | 0.00000985 | 136.9863 | 0.00135 | 0.00004 | **1.3** |
| 02HKH003 | 542325 | 6046363 | Pan HMC | 8.05 | 1 | 1 | 16.98 | 16.98 | 0.01698 | 0.00001698 | 124.2236 | 0.00211 | 0.00006 | **2.1** |
| 02MDH100 | 511549 | 6107259 | Beach HMC | 16.95 | 3 | 3 | 15.73 | 15.73 | 0.01573 | 0.00001573 | 58.99705 | 0.00093 | 0.00003 | **0.9** |
| 02MDH101 | 517684 | 6108161 | Beach HMC | 19.25 | 4 | 4 | 123.08 | 123.08 | 0.12308 | 0.00012308 | 51.948052 | 0.00639 | 0.00019 | **6.4** |
| 02MDH102 | 513619 | 6094434 | Pan HMC | 7.50 | 9 | 9 | 149.61 | 149.61 | 0.14961 | 0.00014961 | 133.33333 | 0.01995 | 0.00058 | **19.9** |
| 02MDH103 | 513505 | 6094322 | Pan HMC | 6.75 | 0 | 0 | 0 | 0 | 0 | 0 | 148.14815 | 0.00000 | 0.00000 | **0.0** |
| 02WCH001 | 514781 | 6044811 | Pan HMC | 15.60 | 1 | 1 | 3.25 | 3.25 | 0.00325 | 0.00000325 | 64.102564 | 0.00021 | 0.00001 | **0.2** |
| 02WCH002 | 513776 | 6043896 | Pan HMC | 11.15 | 0 | 0 | 0 | 0 | 0 | 0 | 89.686099 | 0.00000 | 0.00000 | **0.0** |
| 02WCH003 | 513315 | 6040184 | Pan HMC | 8.50 | 1 | 1 | 13.11 | 13.11 | 0.01311 | 0.00001311 | 117.64706 | 0.00154 | 0.00004 | **1.5** |
| 02WCH004 | 517682 | 6037764 | Pan HMC | 6.60 | 3 | 3 | 71.47 | 71.47 | 0.07147 | 0.00007147 | 151.51515 | 0.01083 | 0.00032 | **10.8** |
| 02WCH005 | 517674 | 6037705 | Pan HMC | 7.50 | 0 | 0 | 0 | 0 | 0 | 0 | 133.33333 | 0.00000 | 0.00000 | **0.0** |
| 02WCH006 | 523646 | 6035396 | Pan HMC | 4.95 | 1 | 1 | 26.73 | 26.73 | 0.02673 | 0.00002673 | 202.0202 | 0.00540 | 0.00016 | **5.4** |
| 02MDH104 | 518048 | 6066707 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |
| 02MDH105 | 517087 | 6073974 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |
| 02MDH106 | 509423 | 6092937 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |
| 02MDH107 | 506378 | 6095322 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |

## 2002-2003 Compiled Gold Grain Results From Pan HMC Samples - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | utmx_n27 | utmy_n27 | Sample Type | Sample Weight(kg) | Grains Picked | Grains Est. | Estimated Weight of Au (um) | (um)corr | mg | g | Factor wt to 1000kg | Grade grams/ tonne (ppm) | Grade oz/ ton | Estimated Conc. ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02CDH103 | 531900 | 6092775 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |
| 02ACDGH108 | 536751 | 6076463 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |
| 02CJOH002 | 580455 | 6047510 | Suction Dredge | Geochem Gold Results Received Awaiting Sample Weights | | | | | | | | | | |
| 03NVT001 | 532557 | 6083523 | Till | 14.00 | 0 | 0 | 0 | 0 | 0 | 0 | 71.428571 | 0.00000 | 0.00000 | **0.0** |
| 03NVT002 | 532292 | 6083436 | Till | 14.15 | 6 | 6 | 42.41 | 42.41 | 0.04241 | 0.00004241 | 70.671378 | 0.00300 | 0.00009 | **3.0** |
| 03NVT003 | 532097 | 6083249 | Till | 13.25 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 75.471698 | 0.00008 | 0.00000 | **0.1** |
| 03NVT004 | 531892 | 6083088 | Till | 11.90 | 3 | 3 | 2.63 | 2.63 | 0.00263 | 0.00000263 | 84.033613 | 0.00022 | 0.00001 | **0.2** |
| 03NVT005 | 531747 | 6082889 | Till | 15.30 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 65.359477 | 0.00002 | 0.00000 | **0.0** |
| 03NVT006 | 531678 | 6082622 | Till | 12.90 | 1 | 1 | 4.97 | 4.97 | 0.00497 | 0.00000497 | 77.51938 | 0.00039 | 0.00001 | **0.4** |
| 03NVT007 | 531675 | 6082393 | Till | 15.10 | 0 | 0 | 0 | 0 | 0 | 0 | 66.225166 | 0.00000 | 0.00000 | **0.0** |
| 03NVT008 | 531735 | 6082142 | Till | 17.40 | 0 | 0 | 0 | 0 | 0 | 0 | 57.471264 | 0.00000 | 0.00000 | **0.0** |
| 03NVT009 | 531675 | 6081661 | Till | 13.10 | 1 | 1 | 8.43 | 8.43 | 0.00843 | 0.00000843 | 76.335878 | 0.00064 | 0.00002 | **0.6** |
| 03NVT010 | 532128 | 6081408 | Till | 20.25 | 1 | 1 | 0.1 | 0.1 | 0.0001 | 0.0000001 | 49.382716 | 0.00000 | 0.00000 | **0.0** |
| 03NVT011 | 531095 | 6077657 | Till | 15.65 | 3 | 3 | 53.88 | 53.88 | 0.05388 | 0.00005388 | 63.897764 | 0.00344 | 0.00010 | **3.4** |
| 03NVT012 | 529235 | 6075769 | Till | 14.20 | 0 | 0 | 0 | 0 | 0 | 0 | 70.422535 | 0.00000 | 0.00000 | **0.0** |
| 03NVT013 | 529466 | 6075843 | Till | 15.20 | 0 | 0 | 0 | 0 | 0 | 0 | 65.789474 | 0.00000 | 0.00000 | **0.0** |
| 03NVT014 | 529591 | 6075905 | Till | 18.10 | 0 | 0 | 0 | 0 | 0 | 0 | 55.248619 | 0.00000 | 0.00000 | **0.0** |
| 03NVT015 | 529959 | 6076228 | Till | 18.20 | 1 | 1 | 0.46 | 0.46 | 0.00046 | 0.00000046 | 54.945055 | 0.00003 | 0.00000 | **0.0** |
| 03NVT016 | 530190 | 6076336 | Till | 15.85 | 3 | 3 | 1.84 | 1.84 | 0.00184 | 0.00000184 | 63.091483 | 0.00012 | 0.00000 | **0.1** |
| 03NVT017 | 530431 | 6076424 | Till | 15.35 | 0 | 0 | 0 | 0 | 0 | 0 | 65.14658 | 0.00000 | 0.00000 | **0.0** |
| 03NVT018 | 530639 | 6076587 | Till | 15.45 | 1 | 1 | 4.97 | 4.97 | 0.00497 | 0.00000497 | 64.724919 | 0.00032 | 0.00001 | **0.3** |
| 03NVT019 | 530986 | 6076674 | Till | 17.05 | 0 | 0 | 0 | 0 | 0 | 0 | 58.651026 | 0.00000 | 0.00000 | **0.0** |
| 03NVT020 | 531214 | 6077145 | Till | 14.35 | 0 | 0 | 0 | 0 | 0 | 0 | 69.686411 | 0.00000 | 0.00000 | **0.0** |
| 03NVT021 | 531054 | 6078181 | Till | 13.75 | 3 | 3 | 0.91 | 0.91 | 0.00091 | 0.00000091 | 72.727273 | 0.00007 | 0.00000 | **0.1** |
| 03NVT022 | 531131 | 6078642 | Till | 13.40 | 4 | 4 | 3.16 | 3.16 | 0.00316 | 0.00000316 | 74.626866 | 0.00024 | 0.00001 | **0.2** |
| 03NVT023 | 531248 | 6078867 | Till | 15.40 | 2 | 2 | 0.26 | 0.26 | 0.00026 | 0.00000026 | 64.935065 | 0.00002 | 0.00000 | **0.0** |
| 03NVT024 | 531494 | 6078925 | Till | 12.45 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 80.321285 | 0.00008 | 0.00000 | **0.1** |
| 03NVT025 | 531773 | 6079605 | Till | 17.20 | 1 | 1 | 0.71 | 0.71 | 0.00071 | 0.00000071 | 58.139535 | 0.00004 | 0.00000 | **0.0** |
| 03NVT026 | 531696 | 6079072 | Till | 14.20 | 1 | 1 | 1.46 | 1.46 | 0.00146 | 0.00000146 | 70.422535 | 0.00010 | 0.00000 | **0.1** |
| 03NVT027 | 531828 | 6080153 | Till | 12.60 | 1 | 1 | 6 | 6 | 0.006 | 0.000006 | 79.365079 | 0.00048 | 0.00001 | **0.5** |
| 03NVT028 | 531869 | 6080625 | Till | 15.75 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 63.492063 | 0.00002 | 0.00000 | **0.0** |
| 03NVT029 | 532404 | 6081079 | Till | 13.05 | 0 | 0 | 0 | 0 | 0 | 0 | 76.628352 | 0.00000 | 0.00000 | **0.0** |
| 03NVT030 | 527472 | 6090112 | Till | 16.30 | 0 | 0 | 0 | 0 | 0 | 0 | 61.349693 | 0.00000 | 0.00000 | **0.0** |
| 03NVT031 | 526661 | 6088821 | Till | 15.65 | 1 | 1 | 3.25 | 3.25 | 0.00325 | 0.00000325 | 63.897764 | 0.00021 | 0.00001 | **0.2** |
| 03NVT032 | 527297 | 6089887 | Till | 16.20 | 2 | 2 | 2.51 | 2.51 | 0.00251 | 0.00000251 | 61.728395 | 0.00015 | 0.00000 | **0.2** |
| 03NVT033 | 527066 | 6089829 | Till | 14.65 | 0 | 0 | 0 | 0 | 0 | 0 | 68.259386 | 0.00000 | 0.00000 | **0.0** |
| 03NVT034 | 527117 | 6089501 | Till | 14.45 | 0 | 0 | 0 | 0 | 0 | 0 | 69.204152 | 0.00000 | 0.00000 | **0.0** |
| 03NVT035 | 526942 | 6089292 | Till | 15.05 | 0 | 0 | 0 | 0 | 0 | 0 | 66.445183 | 0.00000 | 0.00000 | **0.0** |
| 03NVT036 | 526493 | 6088622 | Till | 14.05 | 0 | 0 | 0 | 0 | 0 | 0 | 71.174377 | 0.00000 | 0.00000 | **0.0** |
| 03NVT037 | 526375 | 6088391 | Till | 16.15 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 61.919505 | 0.00002 | 0.00000 | **0.0** |
| 03NVT038 | 526210 | 6088204 | Till | 14.40 | 0 | 0 | 0 | 0 | 0 | 0 | 69.444444 | 0.00000 | 0.00000 | **0.0** |
| 03NVT039 | 526095 | 6087995 | Till | 13.30 | 0 | 0 | 0 | 0 | 0 | 0 | 75.18797 | 0.00000 | 0.00000 | **0.0** |
| 03NVT040 | 525903 | 6087744 | Till | 15.60 | 0 | 0 | 0 | 0 | 0 | 0 | 64.102564 | 0.00000 | 0.00000 | **0.0** |
| 03NVT041 | 522839 | 6083175 | Till | 17.95 | 4 | 4 | 10.27 | 10.27 | 0.01027 | 0.00001027 | 55.710306 | 0.00057 | 0.00002 | **0.6** |
| 03NVT042 | 522985 | 6083408 | Till | 15.35 | 1 | 1 | 0.46 | 0.46 | 0.00046 | 0.00000046 | 65.14658 | 0.00003 | 0.00000 | **0.0** |
| 03NVT043 | 523119 | 6083625 | Till | 16.60 | 0 | 0 | 0 | 0 | 0 | 0 | 60.240964 | 0.00000 | 0.00000 | **0.0** |
| 03NVT044 | 523272 | 6083825 | Till | 18.15 | 0 | 0 | 0 | 0 | 0 | 0 | 55.096419 | 0.00000 | 0.00000 | **0.0** |
| 03NVT045 | 523462 | 6084143 | Till | 19.55 | 0 | 0 | 0 | 0 | 0 | 0 | 51.150895 | 0.00000 | 0.00000 | **0.0** |
| 03NVT046 | 523621 | 6084339 | Till | 16.95 | 0 | 0 | 0 | 0 | 0 | 0 | 58.99705 | 0.00000 | 0.00000 | **0.0** |

## 2002-2003 Compiled Gold Grain Results From Pan HMC Samples - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | utmx_n27 | utmy_n27 | Sample Type | Sample Weight(kg) | Grains Picked | Grains Est. | Estimated Weight of Au (um) | (um)corr | mg | g | Factor wt to 1000kg | Grade grams/ tonne (ppm) | Grade oz/ ton | Estimated Conc. ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03NVT047 | 523742 | 6084549 | Till | 15.70 | 4 | 4 | 10.23 | 10.23 | 0.01023 | 0.00001023 | 63.694268 | 0.00065 | 0.00002 | **0.7** |
| 03NVT048 | 523947 | 6084854 | Till | 13.25 | 0 | 0 | 0 | 0 | 0 | 0 | 75.471698 | 0.00000 | 0.00000 | **0.0** |
| 03NVT049 | 524120 | 6085111 | Till | 16.35 | 1 | 1 | 4.05 | 4.05 | 0.00405 | 0.00000405 | 61.16208 | 0.00025 | 0.00001 | **0.2** |
| 03NVT050 | 524277 | 6085309 | Till | 17.10 | 1 | 1 | 2.56 | 2.56 | 0.00256 | 0.00000256 | 58.479532 | 0.00015 | 0.00000 | **0.1** |
| 03NVT051 | 524408 | 6085528 | Till | 18.20 | 2 | 2 | 1.92 | 1.92 | 0.00192 | 0.00000192 | 54.945055 | 0.00011 | 0.00000 | **0.1** |
| 03NVT052 | 524566 | 6085755 | Till | 16.75 | 0 | 0 | 0 | 0 | 0 | 0 | 59.701493 | 0.00000 | 0.00000 | **0.0** |
| 03NVT053 | 524707 | 6085954 | Till | 17.60 | 0 | 0 | 0 | 0 | 0 | 0 | 56.818182 | 0.00000 | 0.00000 | **0.0** |
| 03NVT054 | 524833 | 6086164 | Till | 16.50 | 2 | 2 | 0.44 | 0.44 | 0.00044 | 0.00000044 | 60.606061 | 0.00003 | 0.00000 | **0.0** |
| 03NVT055 | 524987 | 6086366 | Till | 19.05 | 1 | 1 | 119.54 | 119.54 | 0.11954 | 0.00011954 | 52.493438 | 0.00628 | 0.00018 | **6.3** |
| 03NVT056 | 525140 | 6086583 | Till | 13.85 | 1 | 1 | 1.46 | 1.46 | 0.00146 | 0.00000146 | 72.202166 | 0.00011 | 0.00000 | **0.1** |
| 03NVT057 | 525253 | 6086787 | Till | 12.50 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | 0.00000 | 0.00000 | **0.0** |
| 03NVT058 | 525390 | 6087019 | Till | 14.15 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 70.671378 | 0.00007 | 0.00000 | **0.1** |
| 03NVT059 | 525547 | 6087208 | Till | 14.30 | 3 | 3 | 1.86 | 1.86 | 0.00186 | 0.00000186 | 69.93007 | 0.00013 | 0.00000 | **0.1** |
| 03NVT060 | 522679 | 6082949 | Till | 13.95 | 0 | 0 | 0 | 0 | 0 | 0 | 71.684588 | 0.00000 | 0.00000 | **0.0** |
| 03NVT061 | 525692 | 6087388 | Till | 17.25 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 57.971014 | 0.00006 | 0.00000 | **0.1** |
| 03NVT062 | 525789 | 6087574 | Till | 13.30 | 3 | 3 | 5.41 | 5.41 | 0.00541 | 0.00000541 | 75.18797 | 0.00041 | 0.00001 | **0.4** |
| 03NVT063 | 531523 | 6094924 | Till | 15.05 | 0 | 0 | 0 | 0 | 0 | 0 | 66.445183 | 0.00000 | 0.00000 | **0.0** |
| 03NVT064 | 532036 | 6094937 | Till | 15.95 | 0 | 0 | 0 | 0 | 0 | 0 | 62.695925 | 0.00000 | 0.00000 | **0.0** |
| 03NVT065 | 532527 | 6094895 | Till | 14.75 | 0 | 0 | 0 | 0 | 0 | 0 | 67.79661 | 0.00000 | 0.00000 | **0.0** |
| 03NVT066 | 533013 | 6094830 | Till | 18.00 | 5 | 5 | 4.92 | 4.92 | 0.00492 | 0.00000492 | 55.555556 | 0.00027 | 0.00001 | **0.3** |
| 03NVT067 | 533541 | 6094840 | Till | 15.65 | 1 | 1 | 3.25 | 3.25 | 0.00325 | 0.00000325 | 63.897764 | 0.00021 | 0.00001 | **0.2** |
| 03NVT068 | 534044 | 6094808 | Till | 15.30 | 4 | 4 | 25.12 | 25.12 | 0.02512 | 0.00002512 | 65.359477 | 0.00164 | 0.00005 | **1.6** |
| 03NVT069 | 534557 | 6094768 | Till | 13.40 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 74.626866 | 0.00008 | 0.00000 | **0.1** |
| 03NVT070 | 535047 | 6094705 | Till | 17.85 | 4 | 4 | 2.77 | 2.77 | 0.00277 | 0.00000277 | 56.022409 | 0.00016 | 0.00000 | **0.2** |
| 03NVT071 | 535550 | 6094679 | Till | 20.40 | 1 | 1 | 1.96 | 1.96 | 0.00196 | 0.00000196 | 49.019608 | 0.00010 | 0.00000 | **0.1** |
| 03NVT072 | 536122 | 6094641 | Till | 17.25 | 0 | 0 | 0 | 0 | 0 | 0 | 57.971014 | 0.00000 | 0.00000 | **0.0** |
| 03NVT073 | 536619 | 6094676 | Till | 13.75 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 72.727273 | 0.00002 | 0.00000 | **0.0** |
| 03NVT074 | 537157 | 6094714 | Till | 19.45 | 0 | 0 | 0 | 0 | 0 | 0 | 51.413882 | 0.00000 | 0.00000 | **0.0** |
| 03NVT075 | 537648 | 6094675 | Till | 17.00 | 2 | 2 | 10.31 | 10.31 | 0.01031 | 0.00001031 | 58.823529 | 0.00061 | 0.00002 | **0.6** |
| 03NVT076 | 538206 | 6094984 | Till | 14.85 | 0 | 0 | 0 | 0 | 0 | 0 | 67.340067 | 0.00000 | 0.00000 | **0.0** |
| 03NVT077 | 538641 | 6095146 | Till | 14.75 | 2 | 2 | 2.1 | 2.1 | 0.0021 | 0.0000021 | 67.79661 | 0.00014 | 0.00000 | **0.1** |
| 03NVT078 | 539078 | 6095391 | Till | 15.60 | 1 | 1 | 0.46 | 0.46 | 0.00046 | 0.00000046 | 64.102564 | 0.00003 | 0.00000 | **0.0** |
| 03NVT079 | 539578 | 6095533 | Till | 12.30 | 3 | 3 | 1.31 | 1.31 | 0.00131 | 0.00000131 | 81.300813 | 0.00011 | 0.00000 | **0.1** |
| 03NVT080 | 540067 | 6094564 | Till | 14.90 | 7 | 7 | 3.77 | 3.77 | 0.00377 | 0.00000377 | 67.114094 | 0.00025 | 0.00001 | **0.3** |
| 03NVT081 | 522519 | 6098433 | Till | 21.05 | 1 | 1 | 0.16 | 0.16 | 0.00016 | 0.00000016 | 47.505938 | 0.00001 | 0.00000 | **0.0** |
| 03NVT082 | 522741 | 6098572 | Till | 17.10 | 4 | 4 | 3.41 | 3.41 | 0.00341 | 0.00000341 | 58.479532 | 0.00020 | 0.00001 | **0.2** |
| 03NVT083 | 522958 | 6098688 | Till | 17.05 | 7 | 7 | 14.17 | 14.17 | 0.01417 | 0.00001417 | 58.651026 | 0.00083 | 0.00002 | **0.8** |
| 03NVT084 | 523182 | 6098810 | Till | 18.80 | 1 | 1 | 0.16 | 0.16 | 0.00016 | 0.00000016 | 53.191489 | 0.00001 | 0.00000 | **0.0** |
| 03NVT085 | 521633 | 6097935 | Till | 16.70 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 59.88024 | 0.00002 | 0.00000 | **0.0** |
| 03NVT086 | 521873 | 6098028 | Till | 15.35 | 3 | 3 | 1.09 | 1.09 | 0.00109 | 0.00000109 | 65.14658 | 0.00007 | 0.00000 | **0.1** |
| 03NVT087 | 522077 | 6098152 | Till | 15.20 | 0 | 0 | 0 | 0 | 0 | 0 | 65.789474 | 0.00000 | 0.00000 | **0.0** |
| 03NVT088 | 522311 | 6098304 | Till | 17.50 | 3 | 3 | 31.86 | 31.86 | 0.03186 | 0.00003186 | 57.142857 | 0.00182 | 0.00005 | **1.8** |
| 03NVT089 | 523422 | 6098946 | Till | 16.60 | 0 | 0 | 0 | 0 | 0 | 0 | 60.240964 | 0.00000 | 0.00000 | **0.0** |
| 03NVT090 | 521253 | 6097626 | Till | 15.15 | 0 | 0 | 0 | 0 | 0 | 0 | 66.006601 | 0.00000 | 0.00000 | **0.0** |
| 03NVT091 | 521458 | 6097783 | Till | 17.05 | 2 | 2 | 0.56 | 0.56 | 0.00056 | 0.00000056 | 58.651026 | 0.00003 | 0.00000 | **0.0** |
| 03NVT092 | 521010 | 6097460 | Till | 16.00 | 0 | 0 | 0 | 0 | 0 | 0 | 62.5 | 0.00000 | 0.00000 | **0.0** |
| 03NVT093 | 520807 | 6097380 | Till | 17.20 | 0 | 0 | 0 | 0 | 0 | 0 | 58.139535 | 0.00000 | 0.00000 | **0.0** |
| 03NVT094 | 520054 | 6096912 | Till | 16.35 | 2 | 2 | 2.17 | 2.17 | 0.00217 | 0.00000217 | 61.16208 | 0.00013 | 0.00000 | **0.1** |
| 03NVT095 | 519844 | 6096802 | Till | 20.05 | 2 | 2 | 2.42 | 2.42 | 0.00242 | 0.00000242 | 49.875312 | 0.00012 | 0.00000 | **0.1** |

## 2002-2003 Compiled Gold Grain Results From Pan HMC Samples - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | utmx_n27 | utmy_n27 | Sample Type | Sample Weight(kg) | Grains Picked | Grains Est. | Estimated Weight of Au (um) | (um)corr | mg | g | Factor wt to 1000kg | Grade grams/ tonne (ppm) | Grade oz/ ton | Estimated Conc. ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03NVT096 | 519648 | 6096672 | Till | 18.15 | 2 | 2 | 6.46 | 6.46 | 0.00646 | 0.00000646 | 55.096419 | 0.00036 | 0.00001 | **0.4** |
| 03NVT097 | 519449 | 6096537 | Till | 16.00 | 0 | 0 | 0 | 0 | 0 | 0 | 62.5 | 0.00000 | 0.00000 | **0.0** |
| 03NVT098 | 519240 | 6096397 | Till | 17.25 | 0 | 0 | 0 | 0 | 0 | 0 | 57.971014 | 0.00000 | 0.00000 | **0.0** |
| 03NVT099 | 519029 | 6096261 | Till | 15.55 | 0 | 0 | 0 | 0 | 0 | 0 | 64.308682 | 0.00000 | 0.00000 | **0.0** |
| 03NVT100 | 518828 | 6096099 | Till | 16.45 | 3 | 3 | 1.27 | 1.27 | 0.00127 | 0.00000127 | 60.790274 | 0.00008 | 0.00000 | **0.1** |
| 03NVT101 | 518648 | 6095937 | Till | 16.80 | 2 | 2 | 13.39 | 13.39 | 0.01339 | 0.00001339 | 59.52381 | 0.00080 | 0.00002 | **0.8** |
| 03NVT102 | 518456 | 6095776 | Till | 17.60 | 4 | 4 | 2.62 | 2.62 | 0.00262 | 0.00000262 | 56.818182 | 0.00015 | 0.00000 | **0.1** |
| 03NVT103 | 518249 | 6095600 | Till | 17.90 | 2 | 2 | 0.56 | 0.56 | 0.00056 | 0.00000056 | 55.865922 | 0.00003 | 0.00000 | **0.0** |
| 03NVT104 | 518042 | 6095459 | Till | 16.65 | 0 | 0 | 0 | 0 | 0 | 0 | 60.06006 | 0.00000 | 0.00000 | **0.0** |
| 03NVT105 | 523631 | 6099089 | Till | 14.55 | 1 | 1 | 0.16 | 0.16 | 0.00016 | 0.00000016 | 68.728522 | 0.00001 | 0.00000 | **0.0** |
| 03NVT106 | 523949 | 6099289 | Till | 14.30 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 69.93007 | 0.00007 | 0.00000 | **0.1** |
| 03NVT107 | 524152 | 6099450 | Till | 16.60 | 0 | 0 | 0 | 0 | 0 | 0 | 60.240964 | 0.00000 | 0.00000 | **0.0** |
| 03NVT108 | 524391 | 6099563 | Till | 15.90 | 0 | 0 | 0 | 0 | 0 | 0 | 62.893082 | 0.00000 | 0.00000 | **0.0** |
| 03NVT109 | 524617 | 6099676 | Till | 13.95 | 0 | 0 | 0 | 0 | 0 | 0 | 71.684588 | 0.00000 | 0.00000 | **0.0** |
| 03NVT110 | 516134 | 6094400 | Till | 15.35 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 65.14658 | 0.00007 | 0.00000 | **0.1** |
| 03NVT111 | 515933 | 6094289 | Till | 13.90 | 3 | 3 | 1.33 | 1.33 | 0.00133 | 0.00000133 | 71.942446 | 0.00010 | 0.00000 | **0.1** |
| 03NVT112 | 515716 | 6094159 | Till | 14.80 | 0 | 0 | 0 | 0 | 0 | 0 | 67.567568 | 0.00000 | 0.00000 | **0.0** |
| 03NVT113 | 516573 | 6114682 | Till | 10.20 | 0 | 0 | 0 | 0 | 0 | 0 | 98.039216 | 0.00000 | 0.00000 | **0.0** |
| 03NVT114 | 515555 | 6114622 | Till | 14.00 | 0 | 0 | 0 | 0 | 0 | 0 | 71.428571 | 0.00000 | 0.00000 | **0.0** |
| 03NVT115 | 514865 | 6115384 | Till | 14.55 | 0 | 0 | 0 | 0 | 0 | 0 | 68.728522 | 0.00000 | 0.00000 | **0.0** |
| 03NVT116 | 514124 | 6114911 | Till | 13.05 | 1 | 1 | 0.16 | 0.16 | 0.00016 | 0.00000016 | 76.628352 | 0.00001 | 0.00000 | **0.0** |
| 03NVT117 | 513190 | 6114535 | Till | 12.60 | 0 | 0 | 0 | 0 | 0 | 0 | 79.365079 | 0.00000 | 0.00000 | **0.0** |
| 03NVT118 | 512481 | 6113794 | Till | 12.70 | 0 | 0 | 0 | 0 | 0 | 0 | 78.740157 | 0.00000 | 0.00000 | **0.0** |
| 03NVT119 | 512280 | 6112801 | Till | 12.90 | 0 | 0 | 0 | 0 | 0 | 0 | 77.51938 | 0.00000 | 0.00000 | **0.0** |
| 03NVT120 | 511131 | 6112245 | Till | 12.75 | 0 | 0 | 0 | 0 | 0 | 0 | 78.431373 | 0.00000 | 0.00000 | **0.0** |
| 03NVT121 | 510072 | 6112328 | Till | 11.90 | 0 | 0 | 0 | 0 | 0 | 0 | 84.033613 | 0.00000 | 0.00000 | **0.0** |
| 03NVT122 | 509008 | 6112065 | Till | 11.00 | 1 | 1 | 0.16 | 0.16 | 0.00016 | 0.00000016 | 90.909091 | 0.00001 | 0.00000 | **0.0** |
| 03NVT123 | 507766 | 6111994 | Till | 8.40 | 0 | 0 | 0 | 0 | 0 | 0 | 119.04762 | 0.00000 | 0.00000 | **0.0** |
| 03NVT124 | 506512 | 6111963 | Till | 11.30 | 0 | 0 | 0 | 0 | 0 | 0 | 88.495575 | 0.00000 | 0.00000 | **0.0** |
| 03NVT125 | 547681 | 6037671 | Till | 19.40 | 4 | 4 | 6.08 | 6.08 | 0.00608 | 0.00000608 | 51.546392 | 0.00031 | 0.00001 | **0.3** |
| 03NVT126 | 547024 | 6037227 | Till | 17.65 | 1 | 1 | 4.97 | 4.97 | 0.00497 | 0.00000497 | 56.657224 | 0.00028 | 0.00001 | **0.3** |
| 03NVT127 | 546528 | 6036566 | Till | 19.60 | 2 | 2 | 5.12 | 5.12 | 0.00512 | 0.00000512 | 51.020408 | 0.00026 | 0.00001 | **0.3** |
| 03NVT128 | 546029 | 6036334 | Till | 15.45 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 64.724919 | 0.00007 | 0.00000 | **0.1** |
| 03NVT129 | 545558 | 6036426 | Till | 20.00 | 5 | 5 | 2.44 | 2.44 | 0.00244 | 0.00000244 | 50 | 0.00012 | 0.00000 | **0.1** |
| 03NVT130 | 545105 | 6036629 | Till | 16.20 | 6 | 6 | 5.81 | 5.81 | 0.00581 | 0.00000581 | 61.728395 | 0.00036 | 0.00001 | **0.4** |
| 03NVT131 | 544709 | 6037032 | Till | 13.85 | 0 | 0 | 0 | 0 | 0 | 0 | 72.202166 | 0.00000 | 0.00000 | **0.0** |
| 03NVT132 | 544203 | 6036844 | Till | 17.25 | 0 | 0 | 0 | 0 | 0 | 0 | 57.971014 | 0.00000 | 0.00000 | **0.0** |
| 03NVT133 | 543810 | 6036638 | Till | 16.00 | 4 | 4 | 11.56 | 11.56 | 0.01156 | 0.00001156 | 62.5 | 0.00072 | 0.00002 | **0.7** |
| 03NVT134 | 543339 | 6036969 | Till | 21.30 | 1 | 1 | 0.46 | 0.46 | 0.00046 | 0.00000046 | 46.948357 | 0.00002 | 0.00000 | **0.0** |
| 03NVT135 | 542976 | 6037330 | Till | 16.85 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 59.347181 | 0.00002 | 0.00000 | **0.0** |
| 03NVT136 | 542473 | 6037428 | Till | 19.25 | 3 | 3 | 2.52 | 2.52 | 0.00252 | 0.00000252 | 51.948052 | 0.00013 | 0.00000 | **0.1** |
| 03NVT137 | 542053 | 6037114 | Till | 17.50 | 0 | 0 | 0 | 0 | 0 | 0 | 57.142857 | 0.00000 | 0.00000 | **0.0** |
| 03NVT138 | 541673 | 6036668 | Till | 13.25 | 0 | 0 | 0 | 0 | 0 | 0 | 75.471698 | 0.00000 | 0.00000 | **0.0** |
| 03NVT139 | 541173 | 6036222 | Till | 14.05 | 0 | 0 | 0 | 0 | 0 | 0 | 71.174377 | 0.00000 | 0.00000 | **0.0** |
| 03NVT140 | 540675 | 6035936 | Till | 17.90 | 4 | 4 | 121.33 | 121.33 | 0.12133 | 0.00012133 | 55.865922 | 0.00678 | 0.00020 | **6.8** |
| 03NVT141 | 540390 | 6035442 | Till | 14.65 | 1 | 1 | 1.46 | 1.46 | 0.00146 | 0.00000146 | 68.259386 | 0.00010 | 0.00000 | **0.1** |
| 03NVT142 | 540286 | 6034954 | Till | 16.85 | 4 | 4 | 22.81 | 22.81 | 0.02281 | 0.00002281 | 59.347181 | 0.00135 | 0.00004 | **1.4** |
| 03NVT143 | 540015 | 6034403 | Till | 20.50 | 0 | 0 | 0 | 0 | 0 | 0 | 48.780488 | 0.00000 | 0.00000 | **0.0** |
| 03NVT144 | 539642 | 6033903 | Till | 19.30 | 1 | 1 | 0.28 | 0.28 | 0.00028 | 0.00000028 | 51.813472 | 0.00001 | 0.00000 | **0.0** |

## 2002-2003 Compiled Gold Grain Results From Pan HMC Samples - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | utmx_n27 | utmy_n27 | Sample Type | Sample Weight(kg) | Grains Picked | Grains Est. | Estimated Weight of Au (um) | (um)corr | mg | g | Factor wt to 1000kg | Grade grams/ tonne (ppm) | Grade oz/ ton | Estimated Conc. ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03NVT145 | 539433 | 6033397 | Till | 15.85 | 3 | 3 | 85.3 | 85.3 | 0.0853 | 0.0000853 | 63.091483 | 0.00538 | 0.00016 | **5.4** |
| 03NVT146 | 539005 | 6033224 | Till | 13.95 | 2 | 2 | 22.96 | 22.96 | 0.02296 | 0.00002296 | 71.684588 | 0.00165 | 0.00005 | **1.6** |
| 03NVT147 | 556158 | 6031855 | Till | 16.10 | 1 | 1 | 1.96 | 1.96 | 0.00196 | 0.00000196 | 62.111801 | 0.00012 | 0.00000 | **0.1** |
| 03NVT148 | 555805 | 6031468 | Till | 18.15 | 6 | 6 | 11.16 | 11.16 | 0.01116 | 0.00001116 | 55.096419 | 0.00061 | 0.00002 | **0.6** |
| 03NVT149 | 555568 | 6030985 | Till | 16.60 | 2 | 2 | 6.5 | 6.5 | 0.0065 | 0.0000065 | 60.240964 | 0.00039 | 0.00001 | **0.4** |
| 03NVT150 | 555773 | 6030531 | Till | 14.65 | 1 | 1 | 0.71 | 0.71 | 0.00071 | 0.00000071 | 68.259386 | 0.00005 | 0.00000 | **0.0** |
| 03NVT151 | 556229 | 6030148 | Till | 16.80 | 4 | 4 | 8.13 | 8.13 | 0.00813 | 0.00000813 | 59.52381 | 0.00048 | 0.00001 | **0.5** |
| 03NVT152 | 566328 | 6041870 | Till | 13.40 | 1 | 1 | 1.05 | 1.05 | 0.00105 | 0.00000105 | 74.626866 | 0.00008 | 0.00000 | **0.1** |
| 03NVT153 | 567688 | 6043455 | Till | 16.95 | 1 | 1 | 0.71 | 0.71 | 0.00071 | 0.00000071 | 58.99705 | 0.00004 | 0.00000 | **0.0** |
| 03NVT154 | 568884 | 6045163 | Till | 14.70 | 0 | 0 | 0 | 0 | 0 | 0 | 68.027211 | 0.00000 | 0.00000 | **0.0** |
| 03NVT155 | 570619 | 6046593 | Till | 13.15 | 12 | 12 | 13.73 | 13.73 | 0.01373 | 0.00001373 | 76.045627 | 0.00104 | 0.00003 | **1.0** |
| 03NVT156 | 572284 | 6048023 | Till | 15.20 | 1 | 1 | 1.46 | 1.46 | 0.00146 | 0.00000146 | 65.789474 | 0.00010 | 0.00000 | **0.1** |
| 03NVT400 | 539573 | 6092586 | Till | 10.75 | 1 | 1 | 1.96 | 1.96 | 0.00196 | 0.00000196 | 93.023256 | 0.00018 | 0.00001 | **0.2** |
| 03NVT401 | 539788 | 6092519 | Till | 24.35 | 0 | 0 | 0 | 0 | 0 | 0 | 41.067762 | 0.00000 | 0.00000 | **0.0** |
| 03NVT402 | 540017 | 6092636 | Till | 20.75 | 0 | 0 | 0 | 0 | 0 | 0 | 48.192771 | 0.00000 | 0.00000 | **0.0** |
| 03NVT403 | 539933 | 6092705 | Till | 20.05 | 1 | 1 | 0.46 | 0.46 | 0.00046 | 0.00000046 | 49.875312 | 0.00002 | 0.00000 | **0.0** |
| 03NVT404 | 539842 | 6092720 | Till | 20.65 | 1 | 1 | 1.96 | 1.96 | 0.00196 | 0.00000196 | 48.42615 | 0.00009 | 0.00000 | **0.1** |
| 03NVT405 | 540313 | 6092565 | Till | 22.20 | 0 | 0 | 0 | 0 | 0 | 0 | 45.045045 | 0.00000 | 0.00000 | **0.0** |
| 03NVT406 | 540313 | 6092565 | Till | 18.80 | 1 | 1 | 6 | 6 | 0.006 | 0.000006 | 53.191489 | 0.00032 | 0.00001 | **0.3** |
| 03AMH001 | 528740 | 6094548 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH002 | 527696 | 6095668 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH003 | 508037 | 6132106 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH004 | 502498 | 6119965 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH005 | 508000 | 6122246 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH006 | 541042 | 6094509 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH007 | 539984 | 6090395 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH008 | 539843 | 6097006 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH009 | 538813 | 6113789 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH010 | 511968 | 6089325 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH011 | 525786 | 6094728 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH012 | 516164 | 6091847 | Pan HMC | Awaiting Results | | | | | | | | | | |
| 03AMH013 | 516201 | 6091156 | Pan HMC | Awaiting Results | | | | | | | | | | |
| D-03-01-001 | 541598 | 6092573 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-002 | 541499 | 6092576 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-003 | 541310 | 6092572 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-004 | 541098 | 6092568 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-005 | 541004 | 6092552 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-006 | 540706 | 6092543 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-007 | 540517 | 6092533 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-008 | 540417 | 6092535 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-009 | 540309 | 6092532 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-010 | 540190 | 6092521 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-011 | 540045 | 6092496 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-012 | 539450 | 6092487 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-013 | 538723 | 6092451 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-014 | 538020 | 6092428 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-015 | 539112 | 6092349 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-016 | 538640 | 6091595 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-017 | 539388 | 6092790 | Drill Tailings | Awaiting Results | | | | | | | | | | |

## 2002-2003 Compiled Gold Grain Results From Pan HMC Samples - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | utmx_n27 | utmy_n27 | Sample Type | Sample Weight(kg) | Grains Picked | Grains Est. | Estimated Weight of Au (um) | (um)corr | mg | g | Factor wt to 1000kg | Grade grams/ tonne (ppm) | Grade oz/ ton | Estimated Conc. ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D-03-01-018 | 539709 | 6093287 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-019 | 541687 | 6091474 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-020 | 541015 | 6091900 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-021 | 540449 | 6092234 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-01-022 | 540068 | 6092459 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-001 | 535357 | 6092314 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-002 | 535371 | 6092303 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-003 | 537721 | 6092418 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-004 | 537418 | 6094251 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-005 | 537895 | 6093899 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-006 | 539183 | 6092997 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-007 | 539566 | 6092765 | Drill Tailings | Awaiting Results | | | | | | | | | | |
| D-03-02-008 | 539854 | 6092601 | Drill Tailings | Awaiting Results | | | | | | | | | | |

## 2002 Suction Dredge Assay Results - Swan Hills Property
## Sovereign Mining and Exploration Ltd.

| Sample Number | Sample Type | Sampler | UTM Easting N27 | UTM Northing N27 | ppb Au -140 Sieve (<106um) | ppb Au +140 Sieve (>106um)#1 | ppb Au +140 Sieve (>106um)#2 |
|---|---|---|---|---|---|---|---|
| 02MDH104 | Suction Dredge | MD | 518048 | 6066707 | 6279 | 149 | 9 |
| 02MDH105 | Suction Dredge | MD | 517087 | 6073974 | 2062 | 1011 | 80 |
| 02MDH106 | Suction Dredge | MD | 509423 | 6092937 | 11 | 1 | 1 |
| 02MDH107 | Suction Dredge | MD | 506378 | 6095322 | 1165 | 90 | 67 |
| 02CDH103 | Suction Dredge | CH | 531900 | 6092775 | 59 | 44 | 26 |
| 02ACDGH108 | Suction Dredge | CH | 536751 | 6076463 | 289 | 1 | 1 |
| 02CJOH002 | Suction Dredge | CH | 580455 | 6047510 | 359 | 164 | 2 |

## APPENDIX 6
## 2002-2003 EXPLORATION EXPENDITURES

# 2003 - 2004 Statement of Expenditures - Swan Hills Property
# Sovereign Mining and Exploration Ltd.

| DESCRIPTION | | | COST ($) | TOTAL COST ($) |
|---|---|---|---|---|
| **Salary and Wages** | | | | **78,673.70** |
| | Field Supervisor | | | |
| | | [redacted] | 49,500.00 | |
| | Field Labourers | | | |
| | | [redacted] | 4,800.00 | |
| | | [redacted] | 2,673.70 | |
| | | [redacted] | 21,700.00 | |
| **Field Costs** | | | | **14,518.56** |
| | Fuel | | 967.81 | |
| | Accommodation | | 1,702.33 | |
| | | Hotels in High Prairie and Slave Lake | | |
| | | for C. Hay and N. Torry | | |
| | Satellite Phone | | 2,145.51 | |
| | Meals | | | |
| | | Trip to Sask Research Council | 350.13 | |
| | | Meeting in Drayton Valley | 25.26 | |
| | | Meeting in Edmonton | 126.71 | |
| | Field Supplies | | 3,529.85 | |
| | | batteries, bags, containers, flashlights | | |
| | | propane, winch and other miscellaneous | | |
| | | items | | |
| | Water Hauling | | 395.28 | |
| | Equipment Hauling | | 770.00 | |
| | Equipment Repairs | | 2,664.54 | |
| | Chainsaw | | 674.48 | |
| | Generator | | 1,166.66 | |
| **Rental Equipment** | | | | **45,220.00** |
| | Trackhoe Rental | 1 month @ $4000 per month | 4,000.00 | |
| | Generator Rental | 2 months @ $1100 per month | 2,200.00 | |
| | Quad Rental | 7 months @ $2010 per month | 14,070.00 | |
| | | 0.5 month @ 2140 per month | 1,070.00 | |
| | Argo Rental | 8 months @ $2985 per month | 23,880.00 | |
| **Subcontracting Services** | | | | **152,143.02** |
| | Analysis | | | |
| | | Saskatchewan Research Council | 25,579.20 | |
| | | Loring Labs | 208.00 | |
| | Geological Consultants | | | |
| | | Apex Geoscience | 112,442.11 | |
| | | Geologists | | |
| | | Burton Consulting | 8,676.21 | |
| | | Geologist and indepependant opinion | | |
| | | on samples, etc. | | |
| | Dig Samples | | | |
| | | Williscroft Bros. | 5,237.50 | |
| **Office Charges, Administrative, General** | | | | **29,055.53** |
| | Administration Costs at 10% | | 29,055.53 | |
| **GRAND TOTAL** | | | | **319,610.81** |

**808685 AB Ltd.**
**Box 7859**
**Drayton Valley, AB T7A 1S9**
**Ph: (780) 542-2201 Fax: (780) 542-2550**

2004 AUG -6 A 8:20
ENERGY SRD
ENVIRONMENT
MAILROOM 2

August 4, 2004

Mineral Agreements and Sales
Alberta Resource Development
9945 108th Street
Edmonton, AB T5K 2G6

Attached are 2 copies of the assessment work report of Metallic and Industrial Minerals Permit Nos. 9302040003 to 9302040023. All permits are continguous and have been grouped to facilitate the dispersal of exploration expenditures for our Sovereign Mining project.

We wish to surrender permit nos. 9302040003, 9302040004, 9302040005, 9302040006, 9302040007, 9302040009, 9302040011, 9302040013, 9302040015, 9302040017, 9302040019, 9302040021, 9302040022, and 9302040023.

I have attached authorization to reproduce or copy this report.

If you need further information, please call me at (780) 542-1979. Thank you.

Yours truly,

[redacted]

Neil Torry
808685 AB Ltd.

Enclosures

20040011

JUL 29 2003

# ASSESSMENT REPORT

## SOVEREIGN MINING PROJECT

Swan Hills

808685 AB LTD.

METALLIC AND INDUSTRIAL MINERALS PERMIT NOS. 9302040003 TO 9302040023

SUBMITTED BY: 808685 AB LTD.

AUGUST 4, 2004

Authorization to Reproduce or Copy

808685 AB Ltd. hereby authorizes the Govenment of Alberta to reproduce or copy the attached Assessment Report at the end of the 1 year confidentiality period.

[redacted]

Neil Torry
808685 AB Ltd.

## ENCLOSURES

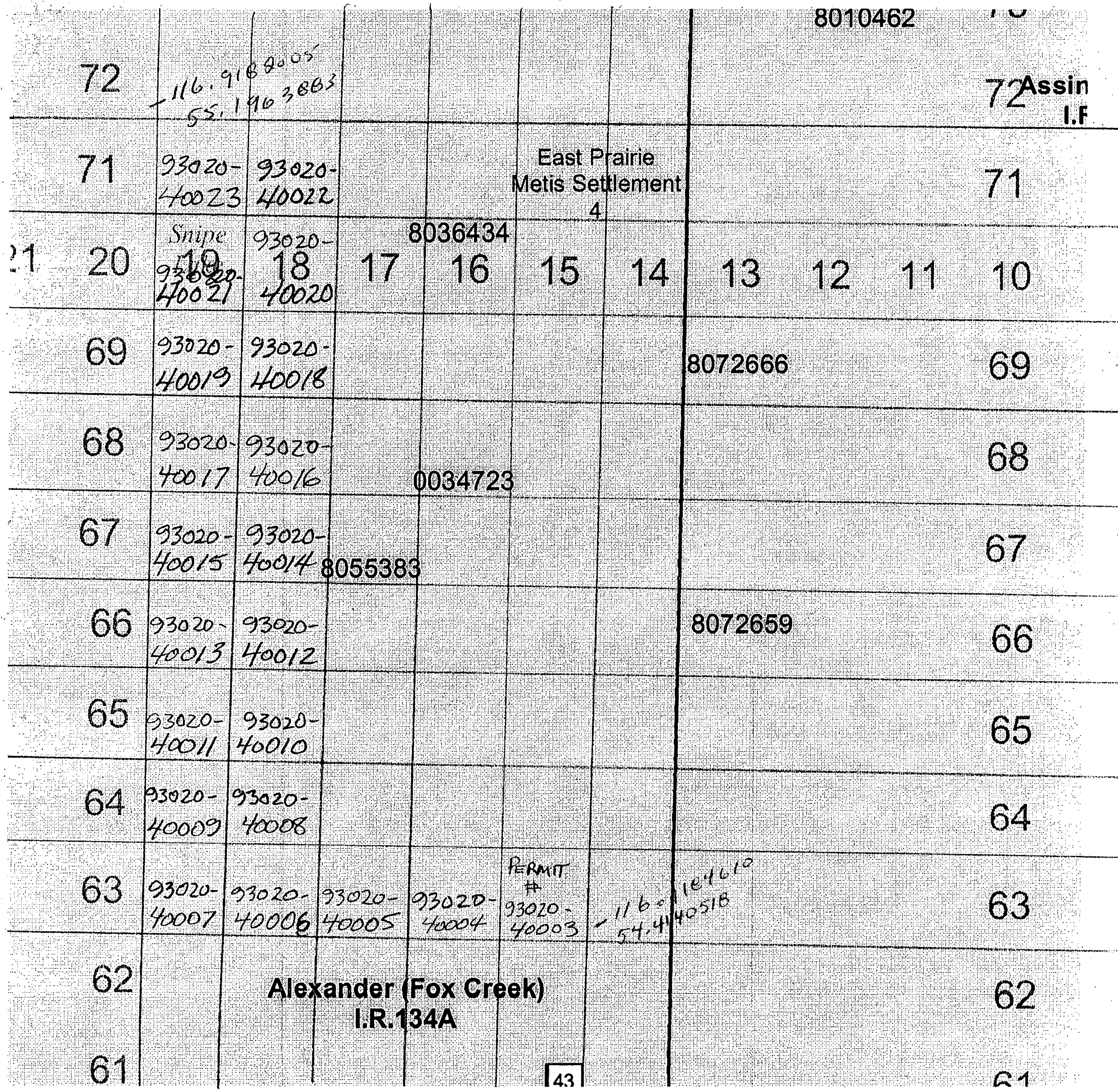
MAP IDENTIFYING PERMIT NUMBERS AND BOUNDARIES

STATEMENT OF EXPENDITURES

CANCELLATIONS AND AMENDMENTS

ALLOCATION OF EXPENDITURES

* ALL TOWNSHIPS & RANGES ARE W5




83K, N

claims retained (v.w)

83K/7,8,10,15

83N/2

technology is our business

# MEMO

March 3, 2004

**TO:** Neil Torry, Sovereign Mining
**FROM:** David Quirt, SRC
**RE:** 'Bentonite' analyses

---

Neil:

This memo deals with the analyses of your clay samples for 'bentonite' content and with general specifications and uses of bentonite clay. Firstly, 'bentonite' actually refers to a clay mineral-rich sediment composed dominantly of the clay mineral 'montmorillonite' - a swelling, or expandable, clay that expands its layer structure when wet by incorporating water between its structural layers. Currently, the clay mineral 'montmorillonite' is usually called 'smectite'.

The analytical work done on your samples included a brief visual observation, whole-rock geochemical analyses, and whole-rock XRD mineralogical analyses. In addition, a series of product specifications and descriptive notes were obtained from several commercial producers of bentonite.

The geochemical data (see attached table) are fairly similar for the samples. They are all dominated by silica ($SiO_2$: 60-70%) with lesser alumina ($Al_2O_3$: 12-18%) and iron ($Fe_2O_3$: 2-6%). Elements of interest for bentonite characterization include calcium, sodium, and magnesium, and these elements are present in moderate amounts (CaO: 0.6-3.3%; $Na_2O$: 0.6-2.2%; MgO: 0.6-2.7%). A comparison with a typical Wyoming bentonite is provided in the table below. From this table, it can be seen that the samples contain similar silica, iron, and magnesium contents, lower alumina, sodium, and LOI (Loss On Ignition: dehydration) contents, and higher calcium, potassium, titanium contents than the Wyoming bentonite. These differences can be explained by the mineralogical data.

| Element (in wt% oxide form) | Sovereign Mining samples (range) | Wyoming bentonite 1 | Wyoming bentonite 2 |
|---|---|---|---|
| $SiO_2$ | 60 - 70 | 61.4 | 60.34 |
| $TiO_2$ | 0.4 - 0.7 | 0.2 | 0.22 |
| $Al_2O_3$ | 12 - 18 | 18.1 | 19.28 |
| $Fe_2O_3$ | 2 - 6 | 3.5 | 3.48 |
| CaO | 0.6 - 3.3 | 0.4 | 0.38 |
| MgO | 0.6 - 2.7 | 1.7 | 1.67 |
| $K_2O$ | 0.9 - 3.5 | 0.1 | 0.10 |
| $Na_2O$ | 0.6 - 2.2 | 2.3 | 2.34 |
| other | 0.02 - 0.57 | 0.07 | 0.07 |
| LOI | 5 - 12 | 12.2 | 12.12 |

The XRD mineralogical data (see attached table) indicate that the samples are mostly rich in expandable clay (smectite: generally 25-70%), with lesser quartz and cristobalite (both are $SiO_2$: generally 10-40% in total) and plagioclase feldspar ($(Na,Ca)AlSi_3O_8$: 5-25%). Other clay minerals are consistently present and occur in minor amounts: illite ($KAl_2Si_4O_{10}(OH)_2$: 3-12%), kaolinite ($Al_2Si_2O_5(OH)_4$: 0-17%), and chlorite ($(Fe,Mg,Al)_6Si_4O_{10}(OH)_8$: 0-5%). The smectite content is typically inversely proportional to the quartz+cristobalite+feldspar content.

Comparison with a commercial Wyoming bentonite is provided in the attached mineralogical data table and in the table below in which three examples from the sample suite are listed along with the commercial bentonite (Bara-kade 90). The XRD diffractograms for these samples are also attached for illustration purposes.

| mineral (wt%) | 'poor' sample P-03-02-005 | 'average' sample P-03-06-001 | 'good' sample P-03-07-004 | Bara-kade 90 |
|---|---|---|---|---|
| smectite | 7 | 41 | 77 | 79 |
| quartz+cristobalite | 69 | 43 | 6 | 15 |
| feldspar | 2 | 8 | 12 | 5 |
| illite | 5 | 4 | 4 | 0 |
| kaolinite | 17 | 1 | 0 | 0 |
| chlorite | 1 | 3 | 1 | 0 |

The presence of illite and chlorite in the sampes is likely responsible for the greenish coloration of the clay. Most of the samples contain excess silica (in quartz+cristobalite) relative to Wyoming bentonite, resulting in relatively low smectite contents (40-50%). Similarly, the presence of minor amounts of feldspar lowers the typical smectite content. Removal of most of the quartz and feldspar would result in a suitable high smectite content. However, other physical properties of the smectitic material would also have to meet the specifications for commercial bentonite before the resource could become economic (see below).

With respect to commercial production of bentonite and the various specifications for this material, the uses of bentonite are many. It is used in the environmental, animal feed, foundry, industrial, oil field, pet litter, water treatment, and other specialty uses. Typical specifications for commercial bentonite include:

- screen analyses (various size ranges)
- industrial properties - moisture (eg. 9%; 12 maximum)
  - swelling index (eg. 28 milliliters)
  - water absorption (eg. 850% over 18 hours)
  - pH (eg. 9.6)
  - CaO content (eg. 0.6 wt%)
- In many cases, the bentonite must have a specified high degree of swelling:
  - 2 grams of the material is to swell to an apparent volume of 16 mls or more when added to 100 mls of distilled water.

In the environmental sector, bentonite is used as a sealant in the construction of liners, caps, and other hydraulic barrier facilities, including landfills, tailings ponds, sewage lagoons, and other hazardous waste sites. For these uses, typical properties include:

- viscosity (eg. 19 to 37, using FANN 600rpm)
- apparent viscosity (eg. 9.5 to 18.5 cps)
- plastic viscosity (eg. 9 to 12 PV)
- yield point (eg. 10 to 13 lb/100ft$^2$; 3x PV maximum)

Foundry applications include use as a binder material for foundry sands and in iron ore pelleting operations. Similarly, in animal feed operations bentonite is used as a binder for livestock feed and mineral supplements. Oil field uses include bore hole and trench stabilization, drilling mud, and slurry trenching. Bentonite is also used in the pet litter sector with untreated sodium bentonite being optimized to produce good 'clumping' characteristics, natural coloration, and low dust production. Bentonite is used in water treatment for clarification by aiding coagulation of the impurities with the bentonite allowing ease of filtering out of the inpurities.

Dave Quirt

Mineral Exploration Section
Environment/Minerals Division

Sovereign Mining (Attention: Neil Torry; February 16/2004) GeoAnalytical Group # 2004-91 (agate grind)

| Sample | SiO2 wt % | TiO2 wt % | Al2O3 wt % | Fe2O3 wt % | CaO wt % | MgO wt % | MnO wt % | K2O wt % | Na2O wt % | P2O5 wt % | LOI wt % | Sum wt % | Ba ppm | Cr ppm | Sc ppm | Sr ppm | Y ppm | Zr ppm | Total wt% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MRG1 standard | 39.4 | 3.65 | 8.36 | 17.5 | 14.3 | 13.2 | 0.16 | 0.21 | 0.71 | 0.06 | | 97.55 | 44 | 434 | 53 | 261 | 13 | 83 | 97.64 |
| P-03-01-001 | 65.8 | 0.41 | 14.0 | 3.91 | 1.58 | 1.64 | 0.03 | 2.44 | 1.21 | 0.03 | 7.8 | 98.85 | 1020 | 96 | 6 | 149 | 21 | 154 | 98.99 |
| P-03-01-002 | 64.9 | 0.48 | 15.7 | 6.08 | 2.54 | 2.28 | 0.02 | 1.06 | 0.99 | 0.12 | 6.0 | 100.17 | 1130 | 159 | 6 | 217 | 24 | 210 | 100.34 |
| P-03-01-003 | 63.1 | 0.49 | 15.5 | 6.50 | 2.01 | 2.54 | 0.03 | 1.14 | 0.74 | 0.07 | 7.1 | 99.22 | 638 | 226 | 8 | 149 | 24 | 179 | 99.34 |
| P-03-02-001 | 67.4 | 0.70 | 16.8 | 4.11 | 0.88 | 1.01 | <0.01 | 2.75 | 1.18 | 0.02 | 5.4 | 100.25 | 663 | 172 | 16 | 137 | 24 | 150 | 100.37 |
| P-03-02-002 | 66.4 | 0.78 | 16.6 | 3.08 | 0.67 | 1.42 | 0.02 | 3.91 | 1.26 | 0.08 | 5.2 | 99.42 | 915 | 275 | 16 | 119 | 26 | 135 | 99.57 |
| P-03-02-003 | 64.7 | 0.70 | 15.7 | 5.58 | 0.89 | 1.07 | 0.02 | 3.67 | 1.03 | 0.03 | 5.0 | 98.39 | 977 | 154 | 17 | 118 | 27 | 121 | 98.53 |
| P-03-02-004 | 68.2 | 0.74 | 15.6 | 2.87 | 0.65 | 0.79 | 0.01 | 3.08 | 1.23 | 0.03 | 4.7 | 97.90 | 821 | 130 | 16 | 118 | 36 | 147 | 98.03 |
| P-03-02-005 | 66.9 | 0.77 | 19.2 | 2.41 | 0.78 | 0.58 | <0.01 | 1.75 | 0.61 | 0.01 | 7.1 | 100.11 | 553 | 157 | 11 | 83 | 15 | 225 | 100.21 |
| P-03-02-006 | 63.7 | 0.73 | 17.3 | 5.21 | 1.03 | 1.21 | 0.01 | 3.37 | 0.83 | 0.09 | 5.8 | 99.28 | 736 | 182 | 19 | 116 | 26 | 131 | 99.40 |
| P-03-03-001 | 66.2 | 0.39 | 14.2 | 4.61 | 1.61 | 1.51 | 0.03 | 2.34 | 1.20 | 0.04 | 7.1 | 99.23 | 964 | 167 | 6 | 155 | 22 | 151 | 99.38 |
| P-03-03-002 | 64.7 | 0.36 | 13.7 | 3.81 | 1.53 | 1.33 | 0.03 | 2.59 | 1.34 | 0.03 | 9.5 | 98.92 | 1080 | 77 | 5 | 156 | 18 | 152 | 99.07 |
| P-03-03-003 | 60.0 | 0.41 | 15.0 | 7.19 | 1.91 | 2.04 | 0.03 | 1.20 | 0.77 | 0.03 | 11.4 | 99.98 | 677 | 176 | 6 | 137 | 20 | 171 | 100.10 |
| P-03-03-004 | 67.8 | 0.40 | 13.1 | 3.32 | 1.45 | 1.14 | 0.03 | 2.83 | 1.57 | 0.05 | 6.7 | 98.39 | 1180 | 41 | 5 | 170 | 22 | 149 | 98.55 |
| P-03-04-001 | 64.5 | 0.56 | 16.5 | 5.60 | 1.87 | 2.67 | 0.03 | 1.65 | 0.53 | 0.03 | 8.0 | 101.94 | 1100 | 71 | 7 | 120 | 19 | 165 | 102.09 |
| P-03-04-002 | 68.2 | 0.18 | 13.0 | 2.15 | 1.22 | 0.58 | 0.03 | 3.54 | 1.94 | 0.02 | 8.6 | 99.46 | 684 | 95 | 3 | 108 | 25 | 182 | 99.57 |
| P-03-04-003 | 65.8 | 0.32 | 11.9 | 2.54 | 1.89 | 0.70 | 0.03 | 2.08 | 1.40 | 0.06 | 12.6 | 99.32 | 850 | 163 | 7 | 169 | 43 | 204 | 99.46 |
| P-03-05-001 | 66.0 | 0.62 | 13.6 | 3.99 | 3.27 | 1.72 | 0.06 | 2.49 | 2.06 | 0.10 | 5.8 | 99.71 | 1570 | 125 | 14 | 350 | 20 | 176 | 99.94 |
| P-03-06-001 | 67.1 | 0.61 | 14.9 | 5.10 | 1.09 | 0.82 | <0.01 | 1.58 | 0.93 | 0.03 | 5.9 | 98.06 | 531 | 119 | 12 | 121 | 61 | 148 | 98.16 |
| P-03-06-002 | 67.1 | 0.78 | 17.8 | 2.77 | 0.88 | 0.83 | <0.01 | 2.00 | 0.92 | <0.01 | 6.3 | 99.38 | 570 | 113 | 13 | 105 | 11 | 173 | 99.48 |
| MRG1 standard | 40.0 | 3.65 | 8.35 | 18.0 | 14.3 | 13.3 | 0.16 | 0.23 | 0.69 | 0.05 | | 98.73 | 44 | 459 | 54 | 263 | 14 | 98 | 98.82 |
| P-03-06-003 | 69.2 | 0.49 | 16.9 | 2.10 | 0.76 | 0.64 | <0.01 | 1.55 | 0.81 | 0.01 | 5.9 | 98.36 | 657 | 70 | 9 | 97 | 9 | 134 | 98.46 |
| P-03-07-001 | 68.1 | 0.54 | 12.7 | 2.84 | 3.29 | 1.61 | 0.03 | 2.14 | 2.17 | 0.10 | 5.3 | 98.82 | 1190 | 147 | 10 | 343 | 19 | 166 | 99.01 |
| P-03-07-002 | 66.9 | 0.65 | 13.7 | 4.72 | 2.47 | 1.94 | 0.02 | 2.37 | 1.71 | 0.12 | 5.1 | 99.70 | 771 | 190 | 13 | 241 | 25 | 141 | 99.84 |
| P-03-07-003 | 67.5 | 0.36 | 14.2 | 3.90 | 1.89 | 1.09 | 0.04 | 2.09 | 1.50 | 0.07 | 7.6 | 100.24 | 773 | 166 | 4 | 185 | 25 | 143 | 100.37 |
| P-03-07-004 | 62.9 | 0.39 | 17.2 | 5.80 | 2.18 | 2.23 | 0.03 | 0.91 | 0.83 | 0.02 | 7.0 | 99.49 | 499 | 508 | 5 | 186 | 18 | 158 | 99.63 |
| P-03-07-005 | 61.4 | 0.71 | 14.9 | 5.77 | 2.71 | 2.29 | 0.43 | 2.87 | 1.59 | 0.13 | 6.2 | 99.00 | 812 | 261 | 15 | 228 | 24 | 120 | 99.15 |
| T-03-01-001 | 66.8 | 0.41 | 14.7 | 5.89 | 1.66 | 1.38 | 0.03 | 1.09 | 0.59 | <0.01 | 6.3 | 98.85 | 364 | 61 | 8 | 147 | 14 | 166 | 98.93 |
| T-03-01-002 | 66.8 | 0.35 | 14.2 | 2.91 | 1.67 | 0.70 | 0.03 | 2.03 | 1.53 | 0.03 | 8.3 | 98.55 | 767 | 46 | 6 | 174 | 28 | 180 | 98.67 |
| T-03-01-003 | 66.0 | 0.34 | 14.9 | 3.50 | 1.62 | 1.28 | 0.03 | 2.65 | 1.40 | 0.05 | 6.7 | 98.47 | 952 | 77 | 5 | 142 | 20 | 129 | 98.60 |
| T-03-01-004 | 67.2 | 0.37 | 13.2 | 3.42 | 1.38 | 1.23 | 0.03 | 2.71 | 1.41 | 0.05 | 7.1 | 98.10 | 1060 | 159 | 5 | 162 | 21 | 146 | 98.26 |
| T-03-01-005 | 66.1 | 0.39 | 14.1 | 5.14 | 1.78 | 1.76 | 0.03 | 2.04 | 1.17 | 0.06 | 6.6 | 99.17 | 874 | 49 | 6 | 162 | 21 | 160 | 99.30 |
| P-03-01-002 repeat | 65.2 | 0.46 | 15.0 | 6.01 | 2.40 | 2.22 | 0.02 | 1.05 | 0.95 | 0.12 | 6.1 | 99.53 | 1060 | 82 | 6 | 208 | 23 | 205 | 99.69 |

DRY ?

Sovereign Mining (Attention: Neil Torry; February/2004) GeoAnalytical Group # 2004-91

| Sample | sample description (note: colour noted while sample was in a 'damp' state (not dried)) | induration | bedding |
|---|---|---|---|
| P-03-01-001 | greenish to dark grey clay | weak | fine-mod (2 mm-3 cm) |
| P-03-01-002 | olive greenish to greenish-grey clay | weak | massive |
| P-03-01-003 | medium olive greenish clay | weak | (semi-)massive |
| P-03-02-001 | medium olive green clay | plastic | massive |
| P-03-02-002 | dark grey clay | weak | massive |
| P-03-02-003 | medium olive green clay | friable to weak | massive |
| P-03-02-004 | light olive green clay | friable to weak | (semi-)massive |
| P-03-02-005 | dark brownish-grey clay | plastic to weak | massive |
| P-03-02-006 | medium olive green clay | friable to plastic | (semi-)massive |
| P-03-03-001 | light to dark beds of olive green clay | weak | fine (1-10 mm) |
| P-03-03-002 | light to dark beds of olive green clay | weak | fine (1-10 mm) |
| P-03-03-003 | dark olive green clay | weak | (semi-)massive |
| P-03-03-004 | medium green clay | weak | massive |
| P-03-04-001 | dark olive greenish-grey clay | weak | massive |
| P-03-04-002 | coal-bearing, dark brown clayey silty sediment | friable to weak | (semi-)massive |
| P-03-04-003 | coal-bearing, very dark brown clayey silty sediment | friable to weak | (semi-)massive |
| P-03-05-001 | medium olive green clay | friable to plastic | (semi-)massive |
| P-03-06-001 | medium olive green clay | friable to weak | massive |
| P-03-06-002 | medium olive greenish-grey clay | plastic | massive |
| P-03-06-003 | medium greenish-grey clay | plastic | massive |
| P-03-06-004 | black coal; with some clay and silt; porous | moderate | fine (2-8 mm) |
| P-03-07-001 | medium olive green clay | friable to plastic | massive |
| P-03-07-002 | medium olive green clay | friable to weak | massive |
| P-03-07-003 | medium olive green to dark greyish-green clay; trace coal streaks | friable | massive |
| P-03-07-004 | medium to dark olive green clay | friable | massive |
| P-03-07-005 | dark olive greenish-grey clay | friable to weak | weak (2-15 mm) |
| T-03-01-001 | dark olive green clay | friable to plastic | massive |
| T-03-01-002 | dark brown, silt- and coal-bearing(??) clay | friable to weak | (semi-)massive |
| T-03-01-003 | medium greyish clay | weak | massive to laminated (mm-scale) |
| T-03-01-004 | medium greyish clay | weak | massive |
| T-03-01-005 | medium olove green to greenish-grey clay | weak | massive to laminated (mm-scale) |
| Bara-kade Standard | off-white to greyish powder | n/a | n/a |
| Bara-kade 90 | off-white to greyish powder | n/a | n/a |

SAND-TRAP SAND / RECLAIM

REMOVED   GOOD   REMOVED   OUT   WANT LESS CLAYS 10-15%

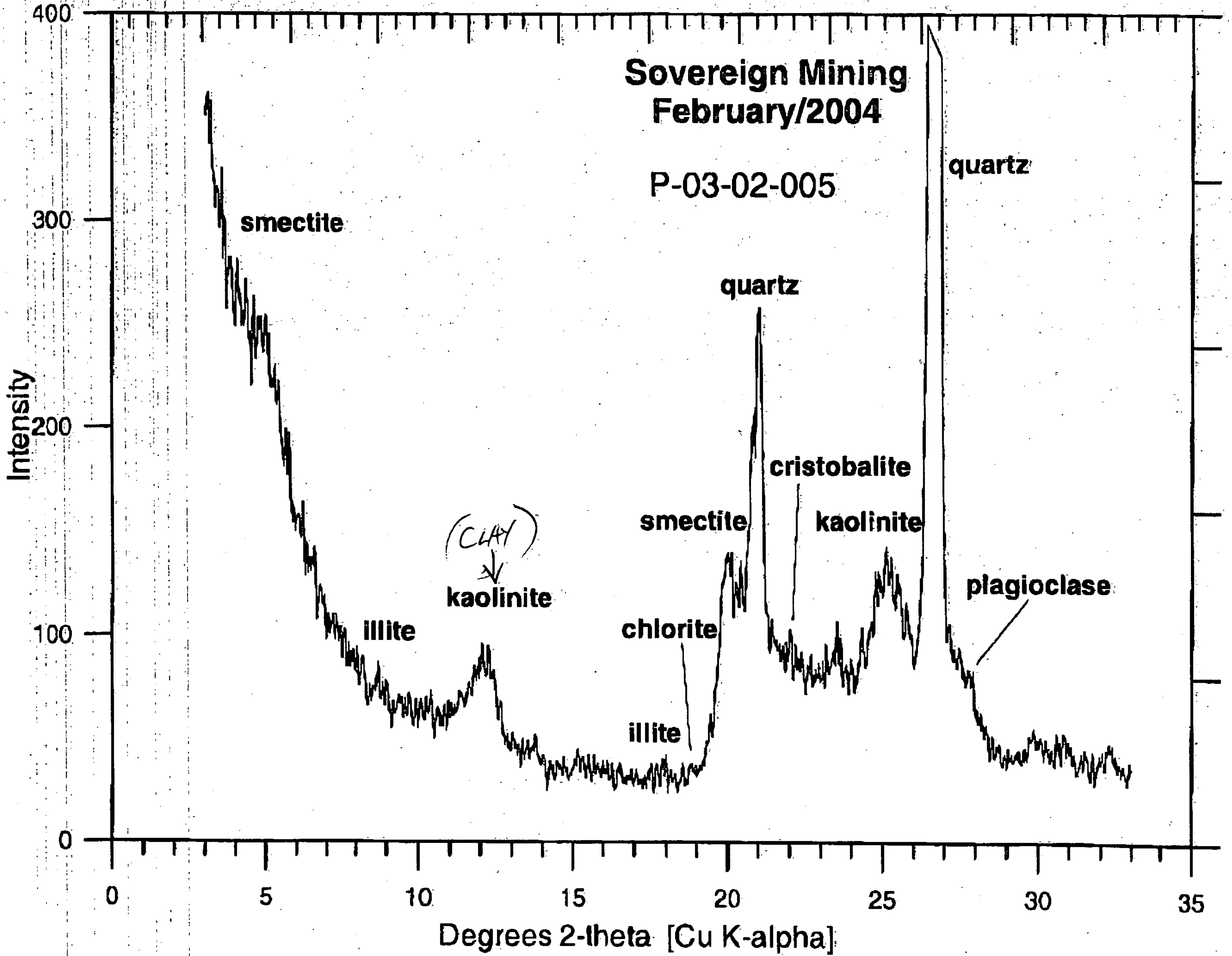
Sovereign Mining (Att

| Sample | quartz | cristobalite ('opaline silica') | plagioclase | K-feldspar | smectite | illite | kaolin | chlorite | 'opaline' silica/ smectite | quartz/'opaline' silica | illite/ smectite | kaolin/ smectite |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-03-01-001 | 11.8 | 2.6 | 8.8 | 0.0 | 57.9 | 12.8 | 0.0 | 6.1 | 0.04 | 4.57 | 0.22 | 0.00 |
| P-03-01-002 | 15.0 | 2.7 | 16.4 | 0.0 | 62.0 | 3.2 | 0.0 | 0.6 | 0.04 | 5.47 | 0.05 | 0.00 |
| P-03-01-003 | 9.5 | 2.1 | 11.3 | 0.0 | 69.3 | 5.5 | 0.0 | 2.4 | 0.03 | 4.43 | 0.08 | 0.00 |
| P-03-02-001 | 45.4 | 0.6 | 11.8 | 0.0 | 35.2 | 4.1 | 2.8 | 0.0 | 0.02 | 80.00 | 0.12 | 0.08 |
| P-03-02-002 | 41.5 | 0.1 | 12.7 | 0.0 | 14.7 | 10.6 | 12.9 | 7.5 | 0.01 | 297.00 | 0.72 | 0.88 |
| P-03-02-003 | 60.6 | 0.3 | 17.0 | 0.0 | 4.9 | 11.9 | 3.1 | 2.3 | 0.06 | 198.00 | 2.43 | 0.62 |
| P-03-02-004 | 30.9 | 0.0 | 9.9 | 0.0 | 36.9 | 9.4 | 12.9 | 0.0 | 0.00 | v/a | 0.25 | 0.35 |
| P-03-02-005 | 68.0 | 0.7 | 1.7 | 0.0 | 6.7 | 4.6 | 17.2 | 1.1 | 0.11 | 94.29 | 0.70 | 2.59 |
| P-03-02-006 | 41.3 | 0.8 | 10.1 | 0.0 | 36.5 | 6.6 | 2.2 | 2.4 | 0.02 | 51.92 | 0.18 | 0.06 |
| P-03-03-001 | 17.5 | 0.9 | 8.1 | 0.0 | 68.5 | 3.9 | 0.0 | 1.1 | 0.01 | 19.64 | 0.06 | 0.00 |
| P-03-03-002 | 9.0 | 3.4 | 6.6 | 0.0 | 74.4 | 4.1 | 0.1 | 2.4 | 0.05 | 2.67 | 0.06 | 0.00 |
| P-03-03-003 | 11.1 | 2.1 | 6.3 | 0.0 | 75.6 | 4.1 | 0.2 | 0.6 | 0.03 | 5.32 | 0.05 | 0.00 |
| P-03-03-004 | 20.8 | 3.3 | 5.2 | 0.0 | 55.6 | 11.5 | 3.9 | 0.0 | 0.06 | 6.29 | 0.21 | 0.07 |
| P-03-04-001 | 7.1 | 2.7 | 7.3 | 0.0 | 68.4 | 12.1 | 2.4 | 0.0 | 0.04 | 2.63 | 0.18 | 0.03 |
| P-03-04-002 | 9.1 | 2.6 | 9.0 | 0.0 | 72.4 | 2.7 | 0.0 | 4.2 | 0.04 | 3.57 | 0.04 | 0.00 |
| P-03-04-003 | 4.7 | 3.3 | 16.2 | 0.0 | 65.1 | 5.5 | 0.0 | 5.2 | 0.05 | 1.41 | 0.08 | 0.00 |
| P-03-05-001 | 37.3 | 0.5 | 17.4 | 0.0 | 36.6 | 5.8 | 0.4 | 1.9 | 0.01 | 73.13 | 0.16 | 0.01 |
| P-03-06-001 | 37.2 | 5.6 | 8.0 | 0.0 | 41.4 | 3.5 | 1.4 | 2.9 | 0.13 | 6.69 | 0.08 | 0.03 |
| P-03-06-002 | 30.7 | 2.2 | 6.2 | 0.0 | 40.8 | 3.6 | 15.2 | 1.3 | 0.05 | 14.00 | 0.09 | 0.37 |
| P-03-06-003 | 33.5 | 4.3 | 5.8 | 9.9 | 25.0 | 0.8 | 18.3 | 2.4 | 0.17 | 7.77 | 0.03 | 0.73 |
| P-03-06-004 | | | | | | | | | | | | |
| P-03-07-001 | 38.3 | 1.7 | 23.9 | 0.0 | 23.7 | 7.2 | 3.4 | 1.8 | 0.07 | 22.17 | 0.30 | 0.14 |
| P-03-07-002 | 38.5 | 2.8 | 25.7 | 0.0 | 26.1 | 5.3 | 0.9 | 0.7 | 0.11 | 13.95 | 0.20 | 0.03 |
| P-03-07-003 | 12.0 | 2.3 | 3.9 | 0.0 | 71.8 | 6.3 | 0.0 | 3.7 | 0.03 | 5.15 | 0.09 | 0.00 |
| P-03-07-004 | 4.6 | 1.4 | 11.9 | 0.0 | 76.7 | 4.1 | 0.0 | 1.3 | 0.02 | 3.30 | 0.05 | 0.00 |
| P-03-07-005 | 36.1 | 2.5 | 21.5 | 0.0 | 25.8 | 7.9 | 1.9 | 4.3 | 0.10 | 14.74 | 0.31 | 0.07 |
| T-03-01-001 | 13.7 | 2.5 | 13.1 | 0.0 | 63.1 | 6.1 | 0.0 | 1.5 | 0.04 | 5.42 | 0.10 | 0.00 |
| T-03-01-002 | 3.6 | 0.7 | 14.3 | 0.0 | 72.9 | 0.0 | 3.4 | 5.2 | 0.01 | 5.09 | 0.00 | 0.05 |
| T-03-01-003 | 24.1 | 2.4 | 9.3 | 0.0 | 45.9 | 15.6 | 0.5 | 2.2 | 0.05 | 10.22 | 0.34 | 0.01 |
| T-03-01-004 | 15.4 | 3.3 | 9.4 | 0.0 | 54.8 | 12.6 | 0.5 | 3.9 | 0.06 | 4.63 | 0.23 | 0.01 |
| T-03-01-005 | 20.2 | 5.0 | 7.8 | 0.0 | 58.9 | 3.9 | 0.0 | 4.2 | 0.09 | 4.02 | 0.07 | 0.00 |
| Bara-kade Standard | 6.9 | 5.7 | 5.3 | 0.0 | 78.4 | 3.7 | 0.0 | 0.0 | 0.07 | 1.21 | 0.05 | 0.00 |
| Bara-kade 90 | 3.5 | 11.8 | 5.2 | 0.0 | 79.4 | 0.0 | 0.0 | 0.0 | 0.15 | 0.30 | 0.00 | 0.00 |

$/TON (STD) 1 - ?
(90) - 2 - ?

COMMERICAL POSSIBILITY
23/30

QUARTZ MARKET FOR SAND


Sovereign Mining
February/2004
P-03-02-005
Intensity
Degrees 2-theta [Cu K-alpha]
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200
300
400
0
5
10
15
20
25
30
35
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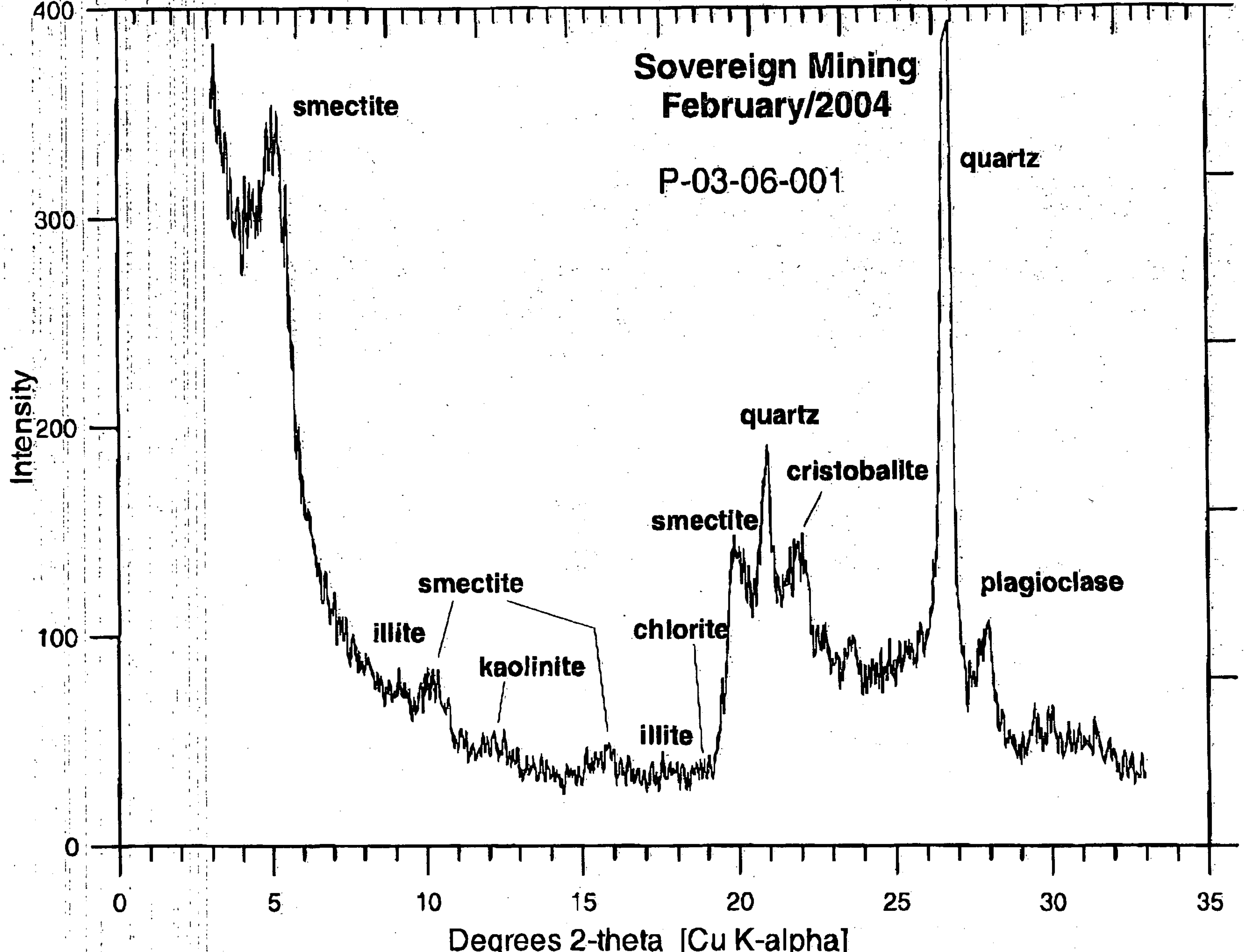
illite
(CLAY)
kaolinite
chlorite
illite
smectite
quartz
cristobalite
kaolinite
quartz
plagioclase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February/2004
P-03-06-001
smectite
quartz
cristobalite
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plagioclase
smectite
illite
chlorite
kaolinite
illite
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200
100
0
0
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10
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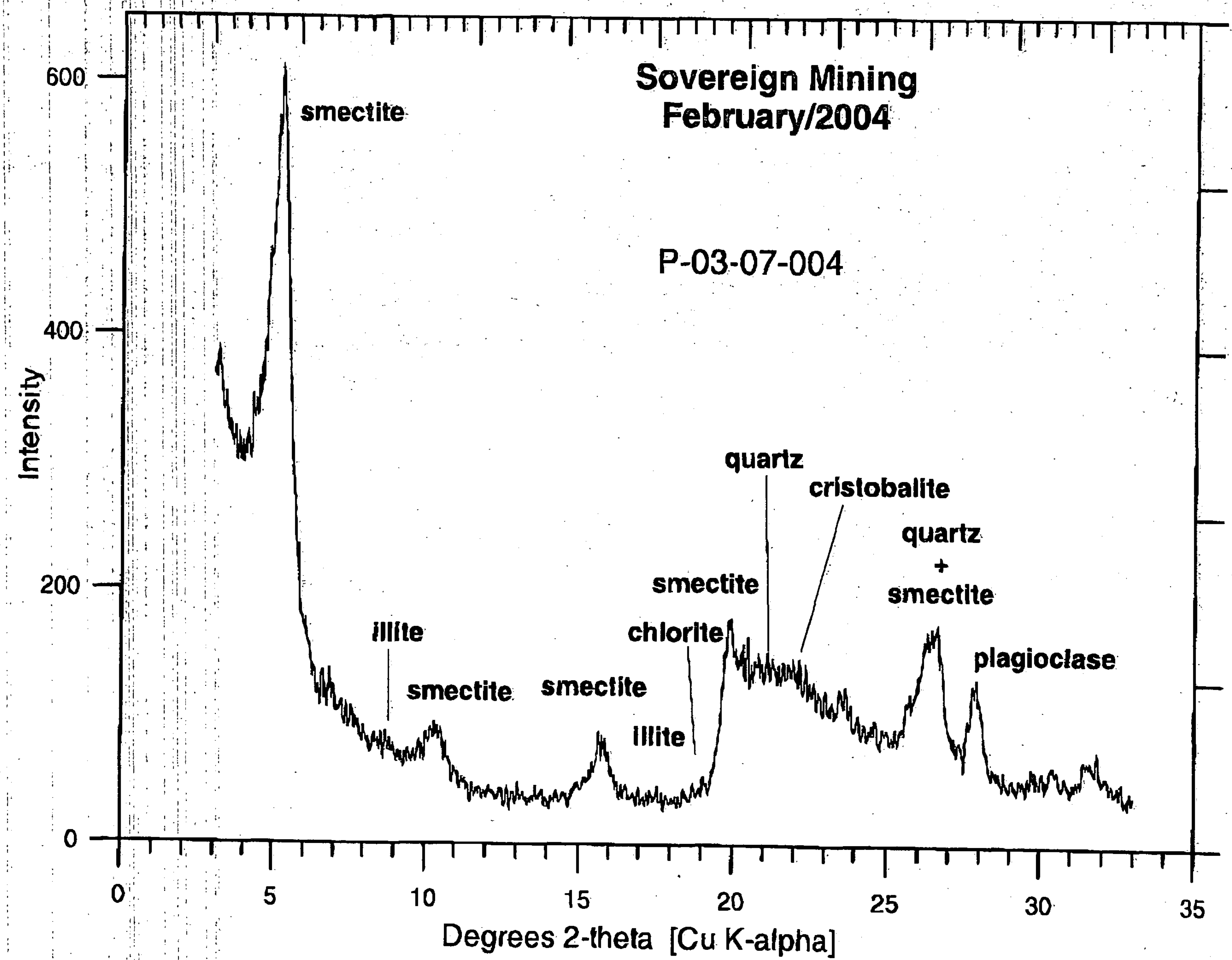
20
25
30
35
Degrees 2-theta [Cu K-alpha]



Sovereign Mining
February/2004
P-03-07-004
Intensity
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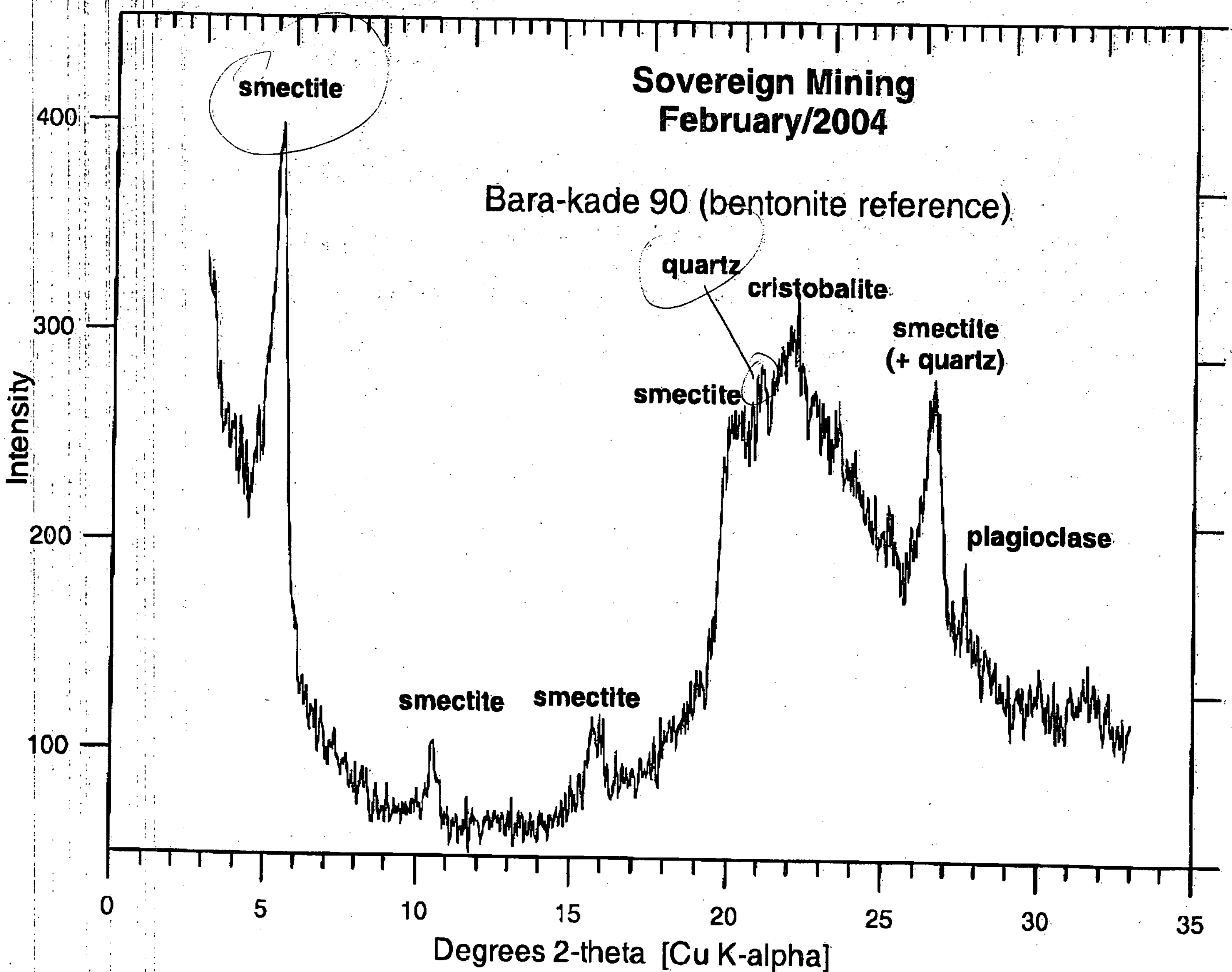
200
400
600
smectite
illite
smectite
smectite
illite
chlorite
smectite
quartz
cristobalite
quartz
+
smectite
plagioclase
0
5
10
15
20
25
30
35
Degrees 2-theta [Cu K-alpha]


Sovereign Mining
February/2004
Bara-kade 90 (bentonite reference)
smectite
quartz
cristobalite
smectite
(+ quartz)
smectite
smectite
smectite
plagioclase
Intensity
400
300
200
100
0
5
10
15
20
25
30
35
Degrees 2-theta [Cu K-alpha]

# CONFIDENTIAL REPORT

# Review of the Swan Hills property of Sovereign Mining & Exploration Limited for gold and diamond potential

by

David Quirt

**Mineral Exploration Branch**

SRC Publication No. 10400-7C03

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September, 2003

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# 1. INTRODUCTION

## 1.1 Nature and Purpose of Investigation

In September 2003, Neil Torrey of Sovereign Mining & Exploration Ltd. (Sovereign) requested that a short review and evaluation be performed by the Saskatchewan Research Council (SRC) Mineral Exploration Section on the available gold grain and Kimberlite Indicator Mineral (KIM) data and interpretations resulting from Sovereign's 1997 to 2002 exploration efforts on their Swan Hills, Alberta, mineral property, located about 45 km northwest of Whitecourt, Alberta (NTS 83J, K, N, O). The permits making up this mineral property were originally staked for diamond exploration primarily due to proximity to the nearby Mountain Lake kimberlite, located northeast of Grande Prairie, Alberta.

## 1.2 Method of Investigation

The gold grain and kimberlite indicator mineral data obtained from samples from Sovereign's Swan Hills property (SRC sample batch numbers OT00:267, OT01:260, OT03:09, and OT03:10) were examined for anomalous characteristics and spatial relationships. A series of written communications from SRC to Bredal Energy Corp (Bredal) concerning these data were reviewed (Quirt, 2001a,b,c,d, 2002, 2003a,b). A 2003 exploration update report on the Swan Hills property, prepared by APEX Geoscience Ltd. (APEX; Dufresne, 2003), was reviewed. This report contained four maps depicting: (1) summary of kimberlite indicator mineral results, (2) oxide kimberlite indicator mineral results, (3) HM total gold grain count (# of Au grains), and (4) HMC gold grain count and estimated total weight gold (ppb Au).

# 2. PROPERTY DATA REVIEW

## 2.1 Gold

The Swan Hills data presented on the Dufresne (2003) maps for (1) HM total gold grain count (# of Au grains), and (2) HMC gold grain count and estimated total weight gold (ppb Au) include the data presented in SRC GeoAnalytical lab reports and in the data tables (summarizing 143 samples in sample batches with SRC identifiers OT00:267 and OT01:260) accompanying written communications to Bredal Energy Corp. (Quirt, 2001a,b, 2002). The 'ppb Au' data is equivalent to the 'Au wt ($\mu$g/10 kg)' values using the following relationship: 1 ppb Au = 10$\mu$g Au/10 kg. These gold grain data are presented in Appendix A and summarized in Table 1.

The description of the gold grain data in Dufresne (2003) included information obtained from three sets of till, soil, and rock survey data: 1997-1999, 2000-2001, and 2002.

1. The information from the 1997-1999 survey data, data which this author has not seen, indicates that very abundant particulate gold grains (400-1200 grains per sample) were obtained from samples from the southwest corner of the Lightbulb Lake permit, a region draining a prominent ridge.
2. The 2000-2001 survey data returned eight samples considered to be anomalous using a 95$^{th}$ percentile value of 57.1 ppb Au (or 571 $\mu$g Au/10 kg sample). The general location of these anomalous samples was not given in Dufresne (2003), however, their locations are easily found (north of the Goose River) on the map displaying total gold grain counts.
3. The 2002 survey program was focussed on the Lightbulb Lake Ridge area (see 1. above). Results from this program confirmed the high grain counts and calculated gold concentrations obtained from this area during earlier surveys. In particular, samples taken from the Lightbulb Lake Ridge area and a south-draining tributary consistently contained elevated gold contents.

Dufresne (2003) summarized the gold sampling program by noting that the eastern half of the Swan Hills property produced samples containing relatively low gold contents, while samples from the western half of the property often contained relatively 'spectacular' gold contents.

These same spatial relationships were noted in Quirt (2001d). Samples from the region along the Goose River and its northern tributary system (which includes the Lightbulb Lake Ridge area) were identified as returning particularly high gold grain counts and gold contents.

The results of the suction dredge sampling program resulted in three samples yielding high gold concentrations in the -0.1 mm size fraction (<100 μm) and low concentrations in the >100 μm material, while the other three samples returned relatively low gold concentrations. This pattern of gold concentration was interpreted by Dufresne (2003) as being suggestive of lode gold sources in the Lightbulb Lake Ridge area. However, the results of the 2000 and 2001 gold analyses indicates that much of the gold in the till samples is relatively coarse (>100 μm; see Table 1). The presence of high proportions of gold grains >100 μm in size suggests that the till material may be more representative of placer-style gold concentrations and/or derivation from relatively local placer-style source(s), in contrast to the stream sediment sampled by the suction dredge.

## 2.2 Kimberlite/Diamonds

In a manner similar to the gold grain data, abundant KIMs have been obtained from samples representing the Lightbulb Lake Ridge area. Fe-oxide KIMs were prevalent, particularly Cr-spinels (chromites), while silicate KIMs were only found in much lesser numbers. Many samples that did contain silicate KIMs contained no, or only a few, chromites. As chromites survive transport better than the other KIMs, the presence of chromite anomalies may represent a relatively distal source or the bimodal distributions of the silicate and oxide KIMs may reflect the influence of different environments of transport/drainage and/or different episodes of transport.

The domination of chromite can be seen in the listing of the picked KIM grains (Table 2). ~90% of the grains picked were chromites, while the next most common KIM picked was garnet (~8%). In general, the chromites were quite magnesian, typically being magnesian chromites and picrochromites, and followed the typical crustal and lherzolitic mantle pattern of moderate $Cr_2O_3$

| OT00:267 | visible Au (# grains) | visible Au (grains/10 kg) | Au wt (ug/10kg) | est ppb Au (= Au wt in ug per 10kg/10) | % grains "I" | % Au grains > 100 um | % Au grains > 150 um |
|---|---|---|---|---|---|---|---|
| OANH 1 | 5 | 4.5 | 40.2 | 4.0 | 20 | 80 | 20 |
| OANH 2 | 10 | 5.4 | 98.7 | 9.9 | 10 | 90 | 60 |
| OANH 3 | 2 | 1.0 | 12.6 | 1.3 | 50 | 100 | 50 |
| OANH 4 | 7 | 2.5 | 14.8 | 1.5 | 29 | 86 | 43 |
| OANH 5 | 7 | 3.2 | 31.5 | 3.1 | 14 | 100 | 86 |
| OANH 6 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OANH 7 | 9 | 4.4 | 14.6 | 1.5 | 44 | 100 | 33 |
| OANH 8 | 37 | 15.0 | 202.2 | 20.2 | 43 | 100 | 73 |
| OANH 9 | 30 | 17.1 | 171.8 | 17.2 | 33 | 87 | 57 |
| OANH 10 | 45 | 18.4 | 116.8 | 11.7 | 42 | 98 | 56 |
| OANH 11 | 25 | 16.6 | 355.0 | 35.5 | 40 | 100 | 68 |
| OANH 12 | 21 | 10.6 | 51.7 | 5.2 | 29 | 90 | 48 |
| OANH 13 | 25 | 19.4 | 153.7 | 15.4 | 36 | 96 | 60 |
| OANH 14 | 14 | 5.5 | 40.1 | 4.0 | 36 | 93 | 50 |
| OANH 15 | 12 | 11.0 | 628.3 | 62.8 | 42 | 92 | 92 |
| OANH 16 | 9 | 6.3 | 169.8 | 17.0 | 67 | 100 | 100 |
| OANH 17 | 13 | 8.6 | 147.1 | 14.7 | 38 | 100 | 92 |
| OANH 18 | 11 | 7.0 | 73.2 | 7.3 | 45 | 91 | 64 |
| OANH 19 | 2 | 1.9 | 4.8 | 0.5 | 50 | 100 | 50 |
| OANH 20 | 9 | 7.8 | 117.7 | 11.8 | 56 | 100 | 78 |
| OANH 21 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OANH 22 | 3 | 4.1 | 15.3 | 1.5 | 67 | 100 | 33 |
| OANH 23 | 4 | 4.1 | 24.1 | 2.4 | 75 | 100 | 75 |
| OANH 24 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OANH 25 | 12 | 12.3 | 64.3 | 6.4 | 17 | 92 | 58 |
| OANH 26 | 3 | 2.3 | 53.6 | 5.4 | 33 | 100 | 67 |
| OANH 27 | 53 | 45.9 | 226.2 | 22.6 | 4 | 62 | 28 |
| OANH 28 | 8 | 6.1 | 43.1 | 4.3 | 13 | 88 | 75 |
| OANH 29 | 66 | 32.0 | 353.4 | 35.3 | 3 | 95 | 67 |
| OANH 30 | 11 | 8.5 | 121.0 | 12.1 | 0 | 91 | 73 |
| OANH 31 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OANH 32 | 5 | 4.6 | 239.4 | 23.9 | 20 | 60 | 40 |
| OANH 33 | 2 | 1.8 | 17.5 | 1.7 | 0 | 100 | 50 |
| OANH 34 | 20 | 13.0 | 196.4 | 19.6 | 5 | 95 | 70 |
| OANH 35 | 5 | 3.4 | 13.7 | 1.4 | 0 | 100 | 60 |
| OANH 36 | 55 | 34.4 | 283.8 | 28.4 | 0 | 78 | 51 |
| OANH 37 | 14 | 12.4 | 108.5 | 10.8 | 0 | 86 | 71 |
| OWAH 101 | 98 | 56.2 | 498.8 | 49.9 | 2 | 86 | 55 |
| OWAH 102 | 60 | 37.0 | 278.5 | 27.9 | 0 | 83 | 53 |
| OWAH 103 | 34 | 21.9 | 170.6 | 17.1 | 0 | 91 | 53 |
| OWAH 104 | 52 | 18.3 | 297.1 | 29.7 | 0 | 98 | 83 |
| OWAH 105 | 12 | 6.1 | 28.4 | 2.8 | 0 | 100 | 50 |
| OWAH 106 | 5 | 2.5 | 5.2 | 0.5 | 0 | 60 | 20 |
| OWAH 107 | 4 | 1.3 | 9.6 | 1.0 | 0 | 100 | 50 |
| OWAH 108 | 35 | 13.5 | 86.0 | 8.6 | 0 | 94 | 51 |
| OWAH 109 | 29 | 15.3 | 170.0 | 17.0 | 0 | 90 | 48 |
| OWAH 110 | 8 | 4.4 | 61.3 | 6.1 | 0 | 100 | 50 |
| OWAH 111 | 30 | 20.0 | 183.1 | 18.3 | 0 | 87 | 70 |
| OWAH 112 | 23 | 10.1 | 140.3 | 14.0 | 0 | 98 | 78 |
| OWAH 113 | 171 | 81.0 | 1176.4 | 117.6 | 3 | 92 | 80 |
| OWAH 114 | 54 | 28.0 | 488.4 | 48.8 | 0 | 98 | 81 |
| OWAH 115 | 8 | 4.0 | 97.5 | 9.8 | 0 | 100 | 88 |
| OWAH 116 | 10 | 5.2 | 98.7 | 9.9 | 0 | 90 | 80 |
| OWAH 117 | 132 | 62.6 | 571.2 | 57.1 | 2 | 76 | 58 |
| OWAH 118 | 7 | 3.6 | 23.6 | 2.4 | 0 | 100 | 86 |
| OWAH 119 | 13 | 8.9 | 156.7 | 15.7 | 0 | 100 | 77 |
| OWAH 120 | 39 | 19.8 | 351.9 | 35.2 | 0 | 95 | 79 |
| OWAH 121 | 8 | 6.4 | 67.2 | 6.7 | 13 | 100 | 75 |

Table 1. Summary of gold grain data: SRC batch numbers OT00:267 and OT01:260.

| OT00:267 | visible Au (# grains) | visible Au (grains/10 kg) | Au wt (ug/10kg) | est ppb Au (= Au wt in ug per 10kg/10) | % grains "I" | % Au grains > 100 um | % Au grains > 150 um |
|---|---|---|---|---|---|---|---|
| OWAH 122 | 5 | 2.8 | 22.5 | 2.2 | 20 | 80 | 40 |
| OWAH 123 | 15 | 7.7 | 172.8 | 17.3 | 0 | 100 | 87 |
| OWAH 124 | 4 | 2.7 | 24.9 | 2.5 | 0 | 100 | 75 |
| OWAH 125 | 7 | 3.8 | 39.6 | 4.0 | 0 | 100 | 57 |
| OWAH 126 | 1 | 0.4 | 5.8 | 0.6 | 0 | 100 | 100 |
| OWAH 127 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OWAH 128 | 5 | 2.5 | 18.2 | 1.8 | 0 | 100 | 100 |
| OWAH 129 | 7 | 3.9 | 56.6 | 5.7 | 0 | 100 | 71 |
| OWAH 130 | 4 | 2.6 | 4.3 | 0.4 | 0 | 100 | 50 |
| OWAH 131 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OWAH 132 | 15 | 8.2 | 87.1 | 8.7 | 0 | 93 | 87 |
| OWAH 133 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OWAH 134 | 2 | 1.4 | 13.9 | 1.4 | 0 | 100 | 50 |
| OWAH 135 | 1 | 0.6 | 0.6 | 0.1 | 0 | 100 | 0 |
| OWAH 136 | 4 | 2.6 | 68.0 | 6.8 | 0 | 100 | 100 |
| OWAH 137 | 1 | 0.5 | 1.0 | 0.1 | 0 | 100 | 0 |
| OWAH 138 | 6 | 3.2 | 54.0 | 5.4 | 0 | 100 | 100 |
| OWAH 139 | 5 | 2.8 | 19.7 | 2.0 | 0 | 100 | 100 |
| OWAH 140 | 8 | 5.1 | 59.5 | 6.0 | 25 | 100 | 75 |
| OWAH 141 | 5 | 3.3 | 36.5 | 3.6 | 0 | 100 | 100 |
| OWAH 142 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a |
| OWAH 143 | 59 | 29.8 | 626.0 | 62.6 | 0 | 98 | 78 |
| OWAH 144 | 12 | 6.6 | 72.4 | 7.2 | 0 | 100 | 83 |
| OWAH 145 | 12 | 7.9 | 50.2 | 5.0 | 8 | 75 | 58 |
| OWAH 146 | 10 | 5.7 | 187.7 | 18.8 | 20 | 90 | 80 |
| OWAH 147 | 33 | 19.5 | 355.4 | 35.5 | 0 | 100 | 94 |
| OWAH 148 | 15 | 8.8 | 121.2 | 12.1 | 0 | 100 | 67 |
| OWAH 149 | 5 | 2.1 | 27.6 | 2.8 | 20 | 100 | 60 |
| OANT 1 | 1 | 0.7 | 6.0 | 0.6 | 0 | 100 | 100 |
| OANP 100 | 5 | 2.6 | 6.6 | 0.7 | 40 | 100 | 20 |
| OANP 101 | 1 | 0.6 | 8.5 | 0.9 | 0 | 100 | 100 |
| OANP 102 | 1 | 0.7 | 0.1 | 0.0 | 0 | 0 | 0 |
| OT01:260 | | | | | | | |
| 01WAH-001 | 32 | 15 | 149.2 | 14.9 | 3 | 84 | 59 |
| 01WAH-002 | 17 | 11 | 344.9 | 34.5 | 0 | 88 | 65 |
| 01WAH-003 | 58 | 33 | 598.2 | 59.8 | 0 | 97 | 83 |
| 01WAH-004 | 28 | 15 | 177.2 | 17.7 | 0 | 96 | 93 |
| 01WAH-005 | 29 | 18 | 329.3 | 32.9 | 0 | 90 | 59 |
| 01WAH-006 | 4 | 3 | 99.8 | 10.0 | 0 | 100 | 100 |
| 01WAH-007 | 32 | 23 | 328.5 | 32.9 | 0 | 94 | 84 |
| 01WAH-008 | 18 | 10 | 104.7 | 10.5 | 0 | 89 | 56 |
| 01WAH-009 | 15 | 9 | 182.1 | 18.2 | 0 | 100 | 47 |
| 01WAH-010 | 25 | 18 | 138.6 | 13.9 | 16 | 84 | 44 |
| 01WAH-011 | 24 | 18 | 138.5 | 13.9 | 4 | 92 | 58 |
| 01WAH-012 | 33 | 20 | 145.4 | 14.5 | 3 | 88 | 58 |
| 01WAH-013 | 75 | 45 | 830.4 | 83.0 | 1 | 95 | 63 |
| 01WAH-014 | 74 | 44 | 612.3 | 61.2 | 1 | 93 | 74 |
| 01WAH-015 | 22 | 19 | 292.1 | 29.2 | 0 | 95 | 73 |
| 01WAH-016 | 6 | 7 | 81.3 | 8.1 | 0 | 100 | 83 |
| 01WAH-017 | 8 | 5 | 60.8 | 6.1 | 0 | 100 | 38 |
| 01WAH-018 | 20 | 11 | 53.2 | 5.3 | 5 | 80 | 50 |
| 01WAH-019 | 58 | 42 | 671.9 | 67.2 | 0 | 93 | 67 |
| 01WAH-020 | 50 | 36 | 1389.3 | 138.9 | 0 | 98 | 92 |
| 01WAH-021 | 23 | 14 | 569.5 | 56.9 | 4 | 87 | 104 |
| 01WAH-022 | 4 | 3 | 71.9 | 7.2 | 0 | 50 | 50 |
| 01WAH-023 | 8 | 8 | 245.2 | 24.5 | 13 | 75 | 63 |
| 01WAH-024 | 1 | 1 | 9.8 | 1.0 | 0 | 100 | 100 |
| 01WAH-025 | 7 | 5 | 53.6 | 5.4 | 0 | 71 | 29 |

Table 1. Continucd.

| 01 00:267 | visible Au (# grains) | visible Au (grains/10 kg) | Au wt (ug/10kg) | est ppb Au (= Au wt in ug per 10kg/10) | % grains "I" | % Au grains > 100 um | % Au grains > 150 um |
|---|---|---|---|---|---|---|---|
| 01WAH-026 | 15 | 9 | 206.1 | 20.6 | 0 | 93 | 73 |
| 01WAH-027 | 25 | 28 | 238.4 | 23.8 | 0 | 88 | 56 |
| 01WAH-028 | 20 | 16 | 298.2 | 29.8 | 5 | 90 | 75 |
| 01WAH-029 | 0 | 0 | 0.0 | 0.0 | n/a | n/a | n/a |
| 01DBH-300 | 4 | 4 | 8.5 | 0.8 | 0 | 75 | 25 |
| 01DBH-301 | 7 | 8 | 90.7 | 9.1 | 0 | 100 | 71 |
| 01DBH-302 | 2 | 2 | 5.1 | 0.5 | 0 | 100 | 50 |
| 01DBH-303 | 6 | 6 | 83.3 | 8.3 | 0 | 100 | 100 |
| 01DBH-304 | 4 | 5 | 27.7 | 2.8 | 0 | 100 | 75 |
| 01DBH-305 | 0 | 0 | 0.0 | 0.0 | n/a | n/a | n/a |
| 01DBH-306 | 0 | 0 | 0.0 | 0.0 | n/a | n/a | n/a |
| 01DBH-307 | 16 | 13 | 297.0 | 29.7 | 0 | 100 | 81 |
| 01DBH-308 | 6 | 5 | 43.0 | 4.3 | 0 | 100 | 67 |
| 01DBH-309 | 4 | 3 | 38.9 | 3.9 | 0 | 100 | 75 |
| 01DBH-310 | 7 | 4 | 60.6 | 6.1 | 0 | 100 | 57 |
| 01DBH-311 | 30 | 19 | 367.9 | 36.8 | 0 | 97 | 83 |
| 01DBH-312 | 27 | 21 | 350.1 | 35.0 | 0 | 100 | 85 |
| 01DBH-313 | 10 | 10 | 151.7 | 15.2 | 20 | 100 | 60 |
| 01DBH-314 | 12 | 13 | 393.2 | 39.3 | 0 | 75 | 75 |
| 01DBH-315 | 3 | 3 | 23.9 | 2.4 | 0 | 100 | 100 |
| 01DBH-316 | 0 | 0 | 0.0 | 0.0 | n/a | n/a | n/a |
| 01DBH-317 | 1 | 1 | 6.6 | 0.7 | 0 | 100 | 100 |
| 01DBH-318 | 1 | 1 | 7.1 | 0.7 | 0 | 100 | 100 |
| 01DBH-319 | 5 | 4 | 113.6 | 11.4 | 0 | 100 | 40 |
| 01MDH-001 | 10 | 8 | 221.6 | 22.2 | 0 | 100 | 60 |
| 01MDH-002 | 3 | 4 | 15.3 | 1.5 | 0 | 100 | 67 |
| 01MDH-003 | 2 | 1 | 4.9 | 0.5 | 0 | 100 | 50 |
| 01MDH-004 | 10 | 7 | 48.2 | 4.8 | 0 | 90 | 50 |

Table 1. Continued.

and MgO contents (40-55% and 6-18%, respectively) which fall below the values needed for inclusion in Diamond Intergrowth and Diamond Inclusion fields. However, a significant number of chromite grains (~6%) did contain greater than 60% $Cr_2O_3$ and plotted in, or very close to, the original Diamond Inclusion and Diamond Intergrowth fields ($Cr_2O_3$ > 60%, MgO > 12%).

Only minor quantities of ilmenite were found (23 grains) and most were distinctly of crustal origin, containing low amounts of MgO (< 4%) and $Cr_2O_3$. Only 4 of these ilmenites displayed compositions compatible with a kimberlite origin.

The garnets picked were mostly peridototic G9 and eclogitic G3 garnets, with a significant number of 'other' Cr-rich crustal grossular/uvarovite and andradite-uvarovite garnets. A number of the G9 garnets lie along the G9-G10 division line on a CaO-$Cr_2O_3$ plot, however, these compositions represent slightly Ca-depleted members of the G9 lherzolitic association, not

| group OT00:267 | mineral | number of grains | percentage |
|---|---|---|---|
| oxide | ilmenite | 10 | 2.3 |
| | Cr-spinel ('chromite') | 428 | 97.3 |
| | low-Cr spinel (Ti-magnetite) | 2 | 0.4 |
| silicate | garnet | 41 | 69.5 |
| | pyroxene ('diopside') | 16 | 27.1 |
| | olivine | 1 | 1.7 |
| | quartz | 1 | 1.7 |
| oxide total | | 440 | 88.2 |
| silicate total | | 59 | 11.8 |

| group OT01:260 | mineral | number of grains | percentage |
|---|---|---|---|
| oxide | ilmenite | 10 | 3.5 |
| | Cr-spinel ('chromite') | 279 | 96.5 |
| | low-Cr spinel (Ti-magnetite) | 0 | 0.0 |
| silicate | garnet | 19 | 86.4 |
| | pyroxene ('diopside') | 2 | 9.1 |
| | olivine | 1 | 4.5 |
| | quartz | 0 | 0.0 |
| oxide total | | 289 | 92.9 |
| silicate total | | 22 | 7.1 |

| groups OT03:09,10 | mineral | number of grains | percentage |
|---|---|---|---|
| oxide | ilmenite | 3 | 2.9 |
| | Cr-spinel ('chromite') | 102 | 97.1 |
| | low-Cr spinel (Ti-magnetite) | 0 | 0.0 |
| silicate | garnet | 39 | 86.7 |
| | pyroxene ('diopside') | 3 | 6.7 |
| | olivine | 3 | 6.7 |
| | quartz | 0 | 0.0 |
| oxide total | | 105 | 70.0 |
| silicate total | | 45 | 30.0 |

Table 2. Oxide and silicate KIM picking data.

the G10 harzbergitic association. Several grains classified as 'G10' based on the Dawson & Stephens criteria, however, the mineral chemistry of these 'G10' grains were only slightly sub-calcic and actually plotted directly on the Gurney G9-G10 85% line (CaO-$Cr_2O_3$ plot) and do not fall into the diamond potential field. Thus these grains should be considered as 'transitional G10' grains that actually belong to the G9 lherzolitic trend and not as true G10 harzburgitic diamond potential grains.

Some of the low-chromium (<2% $Cr_2O_3$), moderate-iron 'eclogitic' garnets (eg. G3, G6) fall into the Diamond Inclusion field on a $TiO_2$-CaO diagram, but only two of the 15 'eclogitic' garnets contain sufficient sodium (> 0.06% $Na_2O$) to be considered as diamond indicator garnets.

A small number of clinopyroxene grains displayed the sub-calcic, high-magnesium, and low-aluminum composition typical of kimberlitic Diamond Inclusion pyroxenes, however, only a few grains also fell into the Diamond Inclusion field on a Ca-Mg-Fe2+ diagram. Most the grains were classified as C2 'diopsides', with only a few as C1 'subcalcic diopside', C5 'chrome diopside', and C6 'ureyitic diopside'. Many of the C5 and C6 clinopyroxenes contained over 1% $Cr_2O_3$ and were termed 'Cr-diopsides'. Note that the 'Diamond Inclusion fields' in many mineral chemistry plots for pyroxenes are not as exclusive as those, for example, for garnet. This is because some non-inclusion pyroxene grains can have compositions similar to kimberlitic pyroxenes and some non-kimberlitic pyroxenes.

The few olivine grains found were strongly magnesian which is typical of kimberlitic olivine. However, they essentially lacked chromium and were not sufficiently magnesian to fall into the field representative of diamond inclusion olivine.

In summary, most of the ilmenite grains of this sample suite did not appear prospective as kimberlite or diamond indicators. Many of the garnet and olivine grains did display KIM compositions and several of the pyroxene grains appeared to display some promise as diamond indicators, but the caveat stated above applies here. However, very few of these silicate grains showed compositions characteristic of Diamond Inclusions or Intergrowths. The most promising diamond indicators in the sample suite were the chromites, as a minor but significant proportion

(~6%) of these grains plotted in the original or extended Diamond Inclusion or Diamond Intergrowth fields.

The SRC written communication (Quirt, 2001d) and the APEX report (Dufresne, 2003) described the locations of the samples containing the best KIM results. Several points are apparent from these reports:

1. The samples with the highest indicator grain counts were not particularly spatially well-related and were on different drainage systems,

2. Nearly adjacent samples typically gave widely varying indicator grain counts.

However, despite these points, the only area in the Swan Hills property to produce consistent indicator mineral grain counts in the 5-30 grains/10 kg range was the west-central part around the Goose River and its tributary systems. The south part of the property (Atikkamek Creek area) produced lower indicator grain counts, but several samples produced prospective diamond indicator mineral grains and the area has not been sufficiently sampled. The northeast corner of the property (East Prairie River, Goldsmith Creek, Driftpile River, Wallace River) produced low indicator mineral grain counts. The northwest corner of the property (West Prairie River) also typically produced low grain counts, although some samples around Snipe Lake returned high numbers.

## 3. RECOMMENDATIONS

It is recommended that:

1. The gold grain data from the 1997-1999 and 2002 Swan Hills surveys be summarized and reviewed in a manner similar to that done for the 2000 and 2001 data.

2. The Lightbulb Lake and the Lightbulb Lake Ridge map features be identified on the sample base maps, as these areas show the most prospective Au grain and KIM results.

3. The relationship(s) between gold grain size-fractionation in till samples versus stream sediment suction dredge samples be investigated, since somewhat conflicting data have been obtained from the dredge sampling program.

4. The Goose River and its northern tributary system (ie. the Lightbulb Lake Ridge area) be further sampled to evaluate the potential for placer gold and for the presence of kimberlites, because samples from this region returned the highest gold grain counts and sample gold content, and the current diamond indicator mineral data and Au data both indicate that this area is the most prospective on the property.

5. The Meekwap Lake/Atikkamek Creek/Iosegun River region be further sampled to evaluate the potential for the presence of kimberlites, because the current low-density sampling has yielded some interesting KIM results despite the few available samples.

6. The follow-up sampling in the Lightbulb Lake Ridge area include till sampling on a grid and/or fence pattern oriented perpendicular to the dominant glacial iceflow direction.

7. The recommendations given in Dufresne (2003) be adopted.

## 4. REFERENCES

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# Appendix A

## Gold grain data

| OT00:267 | sample wt. (kg) | visible Au (grains) | Au wt (ug est.) | grains "A" | grains "I" | visible Au (grains/10 kg) | Au wt est (ug/10kg) | ppb Au (= Au wt in ug per 10kg/10) | grains "A"/ total grains (%) | grains "I"/ total grains (%) | avg Au wt per grain (ug/grain) | # Au grains >100 um | (Au grains > 100 um)/ 10 kg | % Au grains > 100 um | # Au grains > 150 um | (Au grains > 150 um)/10 kg | % Au grains > 150 um |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OANH 1 | 11.16 | 5 | 44.82 | 4 | 1 | 4.5 | 40.2 | 4.0 | 80 | 20 | 9.0 | 4 | 3.6 | 80 | 1 | 0.9 | 20 |
| OANH 2 | 18.50 | 10 | 182.63 | 9 | 1 | 5.4 | 98.7 | 9.9 | 90 | 10 | 18.3 | 9 | 4.9 | 90 | 6 | 3.2 | 60 |
| OANH 3 | 19.15 | 2 | 24.06 | 1 | 1 | 1.0 | 12.6 | 1.3 | 50 | 50 | 12.0 | 2 | 1.0 | 100 | 1 | 0.5 | 50 |
| OANH 4 | 28.15 | 7 | 41.70 | 5 | 2 | 2.5 | 14.8 | 1.5 | 71 | 29 | 6.0 | 6 | 2.1 | 86 | 3 | 1.1 | 43 |
| OANH 5 | 21.90 | 7 | 68.96 | 6 | 1 | 3.2 | 31.5 | 3.1 | 86 | 14 | 9.9 | 7 | 3.2 | 100 | 6 | 2.7 | 86 |
| OANH 6 | 24.00 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OANH 7 | 20.60 | 9 | 30.02 | 5 | 4 | 4.4 | 14.6 | 1.5 | 56 | 44 | 3.3 | 9 | 4.4 | 100 | 3 | 1.5 | 33 |
| OANH 8 | 24.70 | 37 | 499.36 | 21 | 16 | 15.0 | 202.2 | 20.2 | 57 | 43 | 13.6 | 37 | 15.0 | 100 | 27 | 10.9 | 73 |
| OANH 9 | 17.50 | 30 | 300.58 | 20 | 10 | 17.1 | 171.8 | 17.2 | 67 | 33 | 10.0 | 26 | 14.9 | 87 | 17 | 9.7 | 57 |
| OANH 10 | 24.40 | 45 | 285.01 | 26 | 19 | 18.4 | 116.8 | 11.7 | 58 | 42 | 6.3 | 43 | 17.6 | 96 | 25 | 10.2 | 56 |
| OANH 11 | 15.05 | 25 | 534.26 | 15 | 10 | 16.6 | 355.0 | 35.5 | 60 | 40 | 21.4 | 25 | 16.6 | 100 | 17 | 11.3 | 68 |
| OANH 12 | 19.75 | 21 | 102.19 | 15 | 6 | 10.6 | 51.7 | 5.2 | 71 | 29 | 4.9 | 19 | 9.6 | 90 | 10 | 5.1 | 48 |
| OANH 13 | 12.90 | 25 | 198.24 | 16 | 9 | 19.4 | 153.7 | 15.4 | 64 | 36 | 7.9 | 24 | 18.6 | 96 | 15 | 11.6 | 60 |
| OANH 14 | 25.36 | 14 | 101.53 | 9 | 5 | 5.5 | 40.1 | 4.0 | 64 | 36 | 7.3 | 13 | 5.1 | 93 | 7 | 2.8 | 50 |
| OANH 15 | 10.96 | 12 | 687.97 | 7 | 5 | 11.0 | 628.3 | 62.8 | 58 | 42 | 57.3 | 11 | 10.0 | 92 | 11 | 10.0 | 92 |
| OANH 16 | 14.30 | 9 | 242.82 | 3 | 6 | 6.3 | 169.8 | 17.0 | 33 | 67 | 27.0 | 9 | 6.3 | 100 | 9 | 6.3 | 100 |
| OANH 17 | 15.10 | 13 | 222.08 | 8 | 5 | 8.6 | 147.1 | 14.7 | 62 | 38 | 17.1 | 13 | 8.6 | 100 | 12 | 7.9 | 92 |
| OANH 18 | 15.75 | 11 | 115.30 | 6 | 5 | 7.0 | 73.2 | 7.3 | 55 | 45 | 10.5 | 10 | 6.3 | 91 | 7 | 4.4 | 64 |
| OANH 19 | 10.65 | 2 | 5.10 | 1 | 1 | 1.9 | 4.8 | 0.5 | 50 | 50 | 2.6 | 2 | 1.9 | 100 | 1 | 0.9 | 50 |
| OANH 20 | 11.55 | 9 | 135.95 | 4 | 5 | 7.8 | 117.7 | 11.8 | 44 | 56 | 15.1 | 9 | 7.8 | 100 | 7 | 6.1 | 78 |
| OANH 21 | 9.00 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OANH 22 | 7.40 | 3 | 11.35 | 1 | 2 | 4.1 | 15.3 | 1.5 | 33 | 67 | 3.8 | 3 | 4.1 | 100 | 1 | 1.4 | 33 |
| OANH 23 | 9.70 | 4 | 23.42 | 1 | 3 | 4.1 | 24.1 | 2.4 | 25 | 75 | 5.9 | 4 | 4.1 | 100 | 3 | 3.1 | 75 |
| OANH 24 | 10.00 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OANH 25 | 9.75 | 12 | 62.65 | 10 | 2 | 12.3 | 64.3 | 6.4 | 83 | 17 | 5.2 | 11 | 11.3 | 92 | 7 | 7.2 | 58 |
| OANH 26 | 13.00 | 3 | 69.73 | 2 | 1 | 2.3 | 53.6 | 5.4 | 67 | 33 | 23.2 | 3 | 2.3 | 100 | 2 | 1.5 | 67 |
| OANH 27 | 11.55 | 53 | 261.26 | 51 | 2 | 45.9 | 226.2 | 22.6 | 96 | 4 | 4.9 | 33 | 28.6 | 62 | 15 | 13.0 | 28 |
| OANH 28 | 13.10 | 8 | 56.41 | 7 | 1 | 6.1 | 43.1 | 4.3 | 88 | 13 | 7.1 | 7 | 5.3 | 88 | 6 | 4.6 | 75 |
| OANH 29 | 20.60 | 66 | 728.06 | 64 | 2 | 32.0 | 353.4 | 35.3 | 97 | 3 | 11.0 | 63 | 30.6 | 95 | 44 | 21.4 | 67 |
| OANH 30 | 12.95 | 11 | 156.70 | 11 | 0 | 8.5 | 121.0 | 12.1 | 100 | 0 | 14.2 | 10 | 7.7 | 91 | 8 | 6.2 | 73 |
| OANH 31 | 10.85 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OANH 32 | 10.85 | 5 | 259.80 | 4 | 1 | 4.6 | 239.4 | 23.9 | 80 | 20 | 52.0 | 3 | 2.8 | 60 | 2 | 1.8 | 40 |
| OANH 33 | 10.85 | 2 | 18.94 | 2 | 0 | 1.8 | 17.5 | 1.7 | 100 | 0 | 9.5 | 2 | 1.8 | 100 | 1 | 0.9 | 50 |
| OANH 34 | 15.40 | 20 | 302.44 | 19 | 1 | 13.0 | 196.4 | 19.6 | 95 | 5 | 15.1 | 19 | 12.3 | 95 | 14 | 9.1 | 70 |
| OANH 36 | 14.90 | 5 | 20.41 | 5 | 0 | 3.4 | 13.7 | 1.4 | 100 | 0 | 4.1 | 5 | 3.4 | 100 | 3 | 2.0 | 60 |
| OANH 38 | 16.00 | 55 | 454.13 | 55 | 0 | 34.4 | 283.8 | 28.4 | 100 | 0 | 8.3 | 43 | 26.9 | 78 | 28 | 17.5 | 51 |
| OANH 37 | 11.30 | 14 | 122.68 | 14 | 0 | 12.4 | 108.6 | 10.8 | 100 | 0 | 8.8 | 12 | 10.6 | 86 | 10 | 8.8 | 71 |

A-2

| 0T00:287 | sample wt. (kg) | visible Au (grains) | Au wt (ug est.) | grains "A" | grains "I" | visible Au (grains/10 kg) | Au wt (ug/10kg) | est ppb Au (= Au wt in ug per 10kg/10) | grains "A"/total grains (%) | grains "I"/total grains (%) | avg Au wt per grain (ug/grain) | # Au grains >100 um | (Au grains > 100 um)/ 10 kg | % Au grains > 100 um | # Au grains > 150 um | (Au grains > 150 um)/10 kg | % Au grains > 150 um |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OWAH 101 | 17.45 | 98 | 870.36 | 96 | 2 | 58.2 | 498.8 | 49.9 | 98 | 2 | 8.9 | 84 | 48.1 | 86 | 54 | 30.9 | 55 |
| OWAH 102 | 16.20 | 60 | 451.23 | 60 | 0 | 37.0 | 278.5 | 27.9 | 100 | 0 | 7.5 | 50 | 30.9 | 89 | 32 | 19.8 | 53 |
| OWAH 103 | 15.50 | 34 | 264.37 | 34 | 0 | 21.9 | 170.6 | 17.1 | 100 | 0 | 7.8 | 31 | 20.0 | 91 | 18 | 11.6 | 53 |
| OWAH 104 | 28.35 | 52 | 842.18 | 52 | 0 | 18.3 | 297.1 | 29.7 | 100 | 0 | 16.2 | 51 | 18.0 | 98 | 43 | 15.2 | 83 |
| OWAH 105 | 19.70 | 12 | 55.97 | 12 | 0 | 6.1 | 28.4 | 2.8 | 100 | 0 | 4.7 | 12 | 6.1 | 100 | 6 | 3.0 | 50 |
| OWAH 106 | 20.20 | 5 | 10.50 | 5 | 0 | 2.5 | 5.2 | 0.5 | 100 | 0 | 2.1 | 3 | 1.5 | 60 | 1 | 0.5 | 20 |
| OWAH 107 | 31.25 | 4 | 29.87 | 4 | 0 | 1.3 | 9.6 | 1.0 | 100 | 0 | 7.5 | 4 | 1.3 | 100 | 2 | 0.6 | 50 |
| OWAH 108 | 25.95 | 35 | 223.16 | 35 | 0 | 13.5 | 86.0 | 8.6 | 100 | 0 | 6.4 | 33 | 12.7 | 94 | 18 | 6.9 | 51 |
| OWAH 109 | 16.90 | 29 | 321.24 | 29 | 0 | 16.3 | 170.0 | 17.0 | 100 | 0 | 11.1 | 26 | 13.8 | 90 | 14 | 7.4 | 48 |
| OWAH 110 | 18.30 | 8 | 112.20 | 8 | 0 | 4.4 | 61.3 | 6.1 | 100 | 0 | 14.0 | 8 | 4.4 | 100 | 4 | 2.2 | 50 |
| OWAH 111 | 15.00 | 30 | 274.66 | 30 | 0 | 20.0 | 183.1 | 18.3 | 100 | 0 | 9.2 | 26 | 17.3 | 87 | 21 | 14.0 | 70 |
| OWAH 112 | 22.80 | 23 | 319.79 | 23 | 0 | 10.1 | 140.3 | 14.0 | 100 | 0 | 13.9 | 22 | 9.6 | 96 | 18 | 7.9 | 78 |
| OWAH 113 | 21.10 | 171 | 2462.19 | 166 | 5 | 81.0 | 1176.4 | 117.6 | 97 | 3 | 14.5 | 157 | 74.4 | 92 | 136 | 64.5 | 80 |
| OWAH 114 | 19.30 | 54 | 942.60 | 54 | 0 | 28.0 | 488.4 | 48.8 | 100 | 0 | 17.5 | 53 | 27.5 | 98 | 44 | 22.8 | 81 |
| OWAH 115 | 20.10 | 8 | 196.02 | 8 | 0 | 4.0 | 97.5 | 9.8 | 100 | 0 | 24.5 | 8 | 4.0 | 100 | 7 | 3.5 | 88 |
| OWAH 116 | 19.15 | 10 | 186.97 | 10 | 0 | 5.2 | 98.7 | 9.9 | 100 | 0 | 18.9 | 9 | 4.7 | 90 | 8 | 4.2 | 80 |
| OWAH 117 | 21.10 | 132 | 1205.16 | 130 | 2 | 62.6 | 571.2 | 57.1 | 98 | 2 | 9.1 | 100 | 47.4 | 76 | 76 | 36.0 | 58 |
| OWAH 118 | 19.60 | 7 | 46.28 | 7 | 0 | 3.6 | 23.6 | 2.4 | 100 | 0 | 6.6 | 7 | 3.6 | 100 | 6 | 3.1 | 86 |
| OWAH 119 | 14.60 | 13 | 228.80 | 13 | 0 | 8.9 | 156.7 | 15.7 | 100 | 0 | 17.6 | 13 | 8.9 | 100 | 10 | 6.8 | 77 |
| OWAH 120 | 19.70 | 39 | 693.23 | 39 | 0 | 19.8 | 351.9 | 35.2 | 100 | 0 | 17.8 | 37 | 18.8 | 95 | 31 | 15.7 | 79 |
| OWAH 121 | 12.50 | 8 | 84.01 | 7 | 1 | 6.4 | 67.2 | 6.7 | 88 | 13 | 10.5 | 8 | 6.4 | 100 | 6 | 4.8 | 75 |
| OWAH 122 | 17.85 | 5 | 40.08 | 4 | 1 | 2.8 | 22.5 | 2.2 | 80 | 20 | 8.0 | 4 | 2.2 | 80 | 2 | 1.1 | 40 |
| OWAH 123 | 19.60 | 15 | 338.71 | 15 | 0 | 7.7 | 172.8 | 17.3 | 100 | 0 | 22.6 | 15 | 7.7 | 100 | 13 | 6.6 | 87 |
| OWAH 124 | 14.65 | 4 | 36.52 | 4 | 0 | 2.7 | 24.9 | 2.5 | 100 | 0 | 9.1 | 4 | 2.7 | 100 | 3 | 2.0 | 75 |
| OWAH 125 | 18.20 | 7 | 72.01 | 7 | 0 | 3.8 | 39.6 | 4.0 | 100 | 0 | 10.3 | 7 | 3.8 | 100 | 4 | 2.2 | 57 |
| OWAH 126 | 25.70 | 1 | 14.96 | 1 | 0 | 0.4 | 5.8 | 0.6 | 100 | 0 | 15.0 | 1 | 0.4 | 100 | 1 | 0.4 | 100 |
| OWAH 127 | 15.85 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OWAH 128 | 19.70 | 5 | 35.94 | 5 | 0 | 2.5 | 18.2 | 1.8 | 100 | 0 | 7.2 | 5 | 2.5 | 100 | 5 | 2.5 | 100 |
| OWAH 129 | 17.85 | 7 | 101.02 | 7 | 0 | 3.9 | 56.6 | 5.7 | 100 | 0 | 14.4 | 7 | 3.9 | 100 | 5 | 2.8 | 71 |
| OWAH 130 | 15.16 | 4 | 6.54 | 4 | 0 | 2.6 | 4.3 | 0.4 | 100 | 0 | 1.6 | 4 | 2.6 | 100 | 2 | 1.3 | 50 |
| OWAH 131 | 15.60 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OWAH 132 | 18.20 | 15 | 158.47 | 15 | 0 | 8.2 | 87.1 | 8.7 | 100 | 0 | 10.6 | 14 | 7.7 | 93 | 13 | 7.1 | 87 |
| OWAH 133 | 14.95 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OWAH 134 | 14.80 | 2 | 20.82 | 2 | 0 | 1.4 | 13.9 | 1.4 | 100 | 0 | 10.3 | 2 | 1.4 | 100 | 1 | 0.7 | 50 |
| OWAH 135 | 17.00 | 1 | 1.05 | 1 | 0 | 0.6 | 0.6 | 0.1 | 100 | 0 | 1.1 | 1 | 0.6 | 100 | 0 | 0.0 | 0 |
| OWAH 136 | 15.20 | 4 | 103.37 | 4 | 0 | 2.6 | 68.0 | 6.8 | 100 | 0 | 25.8 | 4 | 2.6 | 100 | 4 | 2.6 | 100 |
| OWAH 137 | 19.80 | 1 | 1.96 | 1 | 0 | 0.5 | 1.0 | 0.1 | 100 | 0 | 2.0 | 1 | 0.5 | 100 | 0 | 0.0 | 0 |
| OWAH 138 | 18.80 | 6 | 101.60 | 6 | 0 | 3.2 | 54.0 | 5.4 | 100 | 0 | 16.9 | 6 | 3.2 | 100 | 6 | 3.2 | 100 |
| OWAH 139 | 18.10 | 5 | 35.63 | 5 | 0 | 2.8 | 19.7 | 2.0 | 100 | 0 | 7.1 | 5 | 2.8 | 100 | 5 | 2.8 | 100 |
| OWAH 140 | 15.80 | 8 | 94.06 | 6 | 2 | 5.1 | 59.5 | 6.0 | 75 | 25 | 11.8 | 8 | 5.1 | 100 | 6 | 3.8 | 75 |
| OWAH 141 | 15.05 | 5 | 54.91 | 5 | 0 | 3.3 | 36.5 | 3.6 | 100 | 0 | 11.0 | 5 | 3.3 | 100 | 5 | 3.3 | 100 |
| OWAH 142 | 19.80 | 0 | 0.00 | 0 | 0 | 0.0 | 0.0 | 0.0 | n/a | n/a | n/a | 0 | 0.0 | n/a | 0 | 0.0 | n/a |
| OWAH 143 | 19.80 | 59 | 1239.39 | 59 | 0 | 29.8 | 626.0 | 62.6 | 100 | 0 | 21.0 | 58 | 29.3 | 98 | 46 | 23.2 | 78 |
| OWAH 144 | 18.15 | 12 | 131.38 | 12 | 0 | 6.6 | 72.4 | 7.2 | 100 | 0 | 10.9 | 12 | 6.6 | 100 | 10 | 5.5 | 83 |
| OWAH 145 | 15.10 | 12 | 75.87 | 11 | 1 | 7.9 | 50.2 | 5.0 | 92 | 8 | 6.3 | 9 | 6.0 | 75 | 7 | 4.6 | 58 |
| OWAH 146 | 17.65 | 10 | 331.30 | 8 | 2 | 5.7 | 187.7 | 18.8 | 80 | 20 | 33.1 | 9 | 5.1 | 90 | 8 | 4.5 | 80 |
| OWAH 147 | 16.90 | 33 | 600.68 | 33 | 0 | 19.5 | 355.4 | 35.5 | 100 | 0 | 18.2 | 33 | 19.5 | 100 | 31 | 18.3 | 94 |
| OWAH 148 | 17.05 | 15 | 206.72 | 15 | 0 | 8.8 | 121.2 | 12.1 | 100 | 0 | 13.8 | 15 | 8.8 | 100 | 10 | 5.9 | 67 |
| OWAH 149 | 23.30 | 5 | 64.31 | 4 | 1 | 2.1 | 27.6 | 2.8 | 80 | 20 | 12.9 | 5 | 2.1 | 100 | 3 | 1.3 | 60 |
| OANT 1 | 14.00 | 1 | 8.43 | 1 | 0 | 0.7 | 6.0 | 0.6 | 100 | 0 | 8.4 | 1 | 0.7 | 100 | 1 | 0.7 | 100 |
| OANP 100 | 19.00 | 5 | 12.62 | 3 | 2 | 2.6 | 6.6 | 0.7 | 60 | 40 | 2.5 | 5 | 2.6 | 100 | 1 | 0.5 | 20 |
| OANP 101 | 17.60 | 1 | 14.96 | 1 | 0 | 0.6 | 8.5 | 0.9 | 100 | 0 | 15.0 | 1 | 0.6 | 100 | 1 | 0.6 | 100 |
| OANP 102 | 14.90 | 1 | 0.10 | 1 | 0 | 0.7 | 0.1 | 0.0 | 100 | 0 | 0.1 | 0 | 0.0 | 0 | 0 | 0.0 | 0 |

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:
Samples: 163

July 7, 2004

| Sample # | Sample Weight in Kg | Visible Gold Grain Count | Estimated Weight of Gold in µg |
|---|---|---|---|
| 03NVT001 | 14.00 | 0 | |
| 03NVT002 | 14.15 | 6 | 42.41 |
| 03NVT003 | 13.25 | 1 | 1.05 |
| 03NVT004 | 11.90 | 3 | 2.63 |
| 03NVT005 | 15.30 | 1 | 0.28 |
| 03NVT006 | 12.90 | 1 | 4.97 |
| 03NVT007 | 15.10 | 0 | |
| 03NVT008 | 17.40 | 0 | |
| 03NVT009 | 13.10 | 1 | 8.43 |
| 03NVT010 | 20.25 | 1 | 0.1 |
| 03NVT011 | 15.65 | 3 | 53.88 |
| 03NVT012 | 14.20 | 0 | |
| 03NVT013 | 15.20 | 0 | |
| 03NVT014 | 18.10 | 0 | |
| 03NVT015 | 18.20 | 1 | 0.46 |
| 03NVT016 | 15.85 | 3 | 1.84 |
| 03NVT017 | 15.35 | 0 | |
| 03NVT018 | 15.45 | 1 | 4.97 |
| 03NVT019 | 17.05 | 0 | |
| 03NVT020 | 14.35 | 0 | |
| 03NVT021 | 13.75 | 3 | 0.91 |
| 03NVT022 | 13.40 | 4 | 3.16 |
| 03NVT023 | 15.40 | 2 | 0.26 |
| 03NVT024 | 12.45 | 1 | 1.05 |
| 03NVT025 | 17.20 | 1 | 0.71 |
| 03NVT026 | 14.20 | 1 | 1.46 |
| 03NVT027 | 12.60 | 1 | 6 |
| 03NVT028 | 15.75 | 1 | 0.28 |
| 03NVT029 | 13.05 | 0 | |
| 03NVT030 | 16.30 | 0 | |
| 03NVT031 | 15.65 | 1 | 3.25 |
| 03NVT032 | 16.20 | 2 | 2.51 |
| 03NVT033 | 14.65 | 0 | |
| 03NVT034 | 14.45 | 0 | |
| 03NVT035 | 15.05 | 0 | |
| 03NVT036 | 14.05 | 0 | |
| 03NVT037 | 16.15 | 1 | 0.28 |
| 03NVT038 | 14.40 | 0 | |
| 03NVT039 | 13.30 | 0 | |
| 03NVT040 | 15.60 | 0 | |
| 03NVT041 | 17.95 | 4 | 10.27 |
| 03NVT042 | 15.35 | 1 | 0.46 |
| 03NVT043 | 16.60 | 0 | |
| 03NVT044 | 18.15 | 0 | |
| 03NVT045 | 19.55 | 0 | |
| 03NVT046 | 16.95 | 0 | |
| 03NVT047 | 15.70 | 4 | 10.23 |
| 03NVT048 | 13.25 | 0 | |
| 03NVT049 | 16.35 | 1 | 4.05 |

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

| Sample # | Sample Weight in Kg | Visible Gold Grain Count | Estimated Weight of Gold in µg |
|---|---|---|---|
| 03NVT050 | 17.10 | 1 | 2.56 |
| 03NVT051 | 18.20 | 2 | 1.92 |
| 03NVT052 | 16.75 | 0 | |
| 03NVT053 | 17.60 | 0 | |
| 03NVT054 | 16.50 | 2 | 0.44 |
| 03NVT055 | 19.05 | 1 | 119.54 |
| 03NVT056 | 13.85 | 1 | 1.46 |
| 03NVT057 | 12.50 | 0 | |
| 03NVT058 | 14.15 | 1 | 1.05 |
| 03NVT059 | 14.30 | 3 | 1.86 |
| 03NVT060 | 13.95 | 0 | |
| 03NVT061 | 17.25 | 1 | 1.05 |
| 03NVT062 | 13.30 | 3 | 5.41 |
| 03NVT063 | 15.05 | 0 | |
| 03NVT064 | 15.95 | 0 | |
| 03NVT065 | 14.75 | 0 | |
| 03NVT066 | 18.00 | 5 | 4.92 |
| 03NVT067 | 15.65 | 1 | 3.25 |
| 03NVT068 | 15.30 | 4 | 25.12 |
| 03NVT069 | 13.40 | 1 | 1.05 |
| 03NVT070 | 17.85 | 4 | 2.77 |
| 03NVT071 | 20.40 | 1 | 1.96 |
| 03NVT072 | 17.25 | 0 | |
| 03NVT073 | 13.75 | 1 | 0.28 |
| 03NVT074 | 19.45 | 0 | |
| 03NVT075 | 17.00 | 2 | 10.31 |
| 03NVT076 | 14.85 | 0 | |
| 03NVT077 | 14.75 | 2 | 2.1 |
| 03NVT078 | 15.60 | 1 | 0.46 |
| 03NVT079 | 12.30 | 3 | 1.31 |
| 03NVT080 | 14.90 | 7 | 3.77 |
| 03NVT081 | 21.05 | 1 | 0.16 |
| 03NVT082 | 17.10 | 4 | 3.41 |
| 03NVT083 | 17.05 | 7 | 14.17 |
| 03NVT084 | 18.80 | 1 | 0.16 |
| 03NVT085 | 16.70 | 1 | 0.28 |
| 03NVT086 | 15.35 | 3 | 1.09 |
| 03NVT087 | 15.20 | 0 | |
| 03NVT088 | 17.50 | 3 | 31.86 |
| 03NVT089 | 16.60 | 0 | |
| 03NVT090 | 15.15 | 0 | |
| 03NVT091 | 17.05 | 2 | 0.56 |
| 03NVT092 | 16.00 | 0 | |
| 03NVT093 | 17.20 | 0 | |
| 03NVT094 | 16.35 | 2 | 2.17 |
| 03NVT095 | 20.05 | 2 | 2.42 |
| 03NVT096 | 18.15 | 2 | 6.46 |
| 03NVT097 | 16.00 | 0 | |
| 03NVT098 | 17.25 | 0 | |
| 03NVT099 | 15.55 | 0 | |
| 03NVT100 | 16.45 | 3 | 1.27 |

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

| Sample # | Sample Weight in Kg | Visible Gold Grain Count | Estimated Weight of Gold in µg |
|---|---|---|---|
| 03NVT101 | 16.80 | 2 | 13.39 |
| 03NVT102 | 17.60 | 4 | 2.62 |
| 03NVT103 | 17.90 | 2 | 0.56 |
| 03NVT104 | 16.65 | 0 | |
| 03NVT105 | 14.55 | 1 | 0.16 |
| 03NVT106 | 14.30 | 1 | 1.05 |
| 03NVT107 | 16.60 | 0 | |
| 03NVT108 | 15.90 | 0 | |
| 03NVT109 | 13.95 | 0 | |
| 03NVT110 | 15.35 | 1 | 1.05 |
| 03NVT111 | 13.90 | 3 | 1.33 |
| 03NVT112 | 14.80 | 0 | |
| 03NVT113 | 10.20 | 0 | |
| 03NVT114 | 14.00 | 0 | |
| 03NVT115 | 14.55 | 0 | |
| 03NVT116 | 13.05 | 1 | 0.16 |
| 03NVT117 | 12.60 | 0 | |
| 03NVT118 | 12.70 | 0 | |
| 03NVT119 | 12.90 | 0 | |
| 03NVT120 | 12.75 | 0 | |
| 03NVT121 | 11.90 | 0 | |
| 03NVT122 | 11.00 | 1 | 0.16 |
| 03NVT123 | 8.40 | 0 | |
| 03NVT124 | 11.30 | 0 | |
| 03NVT125 | 19.40 | 4 | 6.08 |
| 03NVT126 | 17.65 | 1 | 4.97 |
| 03NVT127 | 19.60 | 2 | 5.12 |
| 03NVT128 | 15.45 | 1 | 1.05 |
| 03NVT129 | 20.00 | 5 | 2.44 |
| 03NVT130 | 16.20 | 6 | 5.81 |
| 03NVT131 | 13.85 | 0 | |
| 03NVT132 | 17.25 | 0 | |
| 03NVT133 | 16.00 | 4 | 11.56 |
| 03NVT134 | 21.30 | 1 | 0.46 |
| 03NVT135 | 16.85 | 1 | 0.28 |
| 03NVT136 | 19.25 | 3 | 2.52 |
| 03NVT137 | 17.50 | 0 | |
| 03NVT138 | 13.25 | 0 | |
| 03NVT139 | 14.05 | 0 | |
| 03NVT140 | 17.90 | 4 | 121.33 |
| 03NVT141 | 14.65 | 1 | 1.46 |
| 03NVT142 | 16.85 | 4 | 22.81 |
| 03NVT143 | 20.50 | 0 | |
| 03NVT144 | 19.30 | 1 | 0.28 |
| 03NVT145 | 15.85 | 3 | 85.3 |
| 03NVT146 | 13.95 | 2 | 22.96 |
| 03NVT147 | 16.10 | 1 | 1.96 |
| 03NVT148 | 18.15 | 6 | 11.16 |
| 03NVT149 | 16.60 | 2 | 6.5 |
| 03NVT150 | 14.65 | 1 | 0.71 |
| 03NVT151 | 16.80 | 4 | 8.13 |

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

| Sample # | Sample Weight in Kg | Visible Gold Grain Count | Estimated Weight of Gold in µg |
|---|---|---|---|
| 03NVT152 | 13.40 | 1 | 1.05 |
| 03NVT153 | 16.95 | 1 | 0.71 |
| 03NVT154 | 14.70 | 0 | |
| 03NVT155 | 13.15 | 12 | 13.73 |
| 03NVT156 | 15.20 | 1 | 1.46 |
| 03NVT400 | 10.75 | 1 | 1.96 |
| 03NVT401 | 24.35 | 0 | |
| 03NVT402 | 20.75 | 0 | |
| 03NVT403 | 20.05 | 1 | 0.46 |
| 03NVT404 | 20.65 | 1 | 1.96 |
| 03NVT405 | 22.20 | 0 | |
| 03NVT406 | 18.80 | 1 | 6 |

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT002**

**Estimated Weight of Gold in micrograms: 42.41**

| Length in µm | Width in µm | Description |
|---|---|---|
| 600 | 200 | I |
| 100 | 80 | I |
| 100 | 80 | I |
| 80 | 60 | I |
| 60 | 60 | I |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT003**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT004**

**Estimated Weight of Gold in micrograms: 2.63**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 80 | A |
| 80 | 80 | A |
| 80 | 60 | I |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT005**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT006**

**Estimated Weight of Gold in micrograms: 4.97**

| Length in µm | Width in µm | Description |
|---|---|---|
| 160 | 140 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT009**

**Estimated Weight of Gold in micrograms: 8.43**

| Length in µm | Width in µm | Description |
|---|---|---|
| 220 | 140 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT010**

**Estimated Weight of Gold in micrograms: 0.1**

| Length in µm | Width in µm | Description |
|---|---|---|
| 40 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT011**

**Estimated Weight of Gold in micrograms: 53.88**

| Length in µm | Width in µm | Description |
|---|---|---|
| 440 | 240 | A |
| 160 | 60 | A |
| 80 | 80 | R |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains. .

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT015**

**Estimated Weight of Gold in micrograms: 0.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT016**

**Estimated Weight of Gold in micrograms: 1.84**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 60 | A |
| 80 | 40 | A |
| 60 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT018**

**Estimated Weight of Gold in micrograms: 4.97**

| Length in µm | Width in µm | Description |
|---|---|---|
| 200 | 100 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT021**

**Estimated Weight of Gold in micrograms: 0.91**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 60 | I |
| 40 | 40 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT022**

**Estimated Weight of Gold in micrograms: 3.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 100 | I |
| 80 | 60 | I |
| 80 | 60 | A |
| 80 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT023**

**Estimated Weight of Gold in micrograms: 0.26**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 40 | I |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT024**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT025**

**Estimated Weight of Gold in micrograms: 0.71**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 80 | I |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT026**

**Estimated Weight of Gold in micrograms: 1.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 80 | R |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT027**

**Estimated Weight of Gold in micrograms: 6**

| Length in µm | Width in µm | Description |
|---|---|---|
| 160 | 160 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT028**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT031**

**Estimated Weight of Gold in micrograms: 3.25**

| Length in µm | Width in µm | Description |
|---|---|---|
| 160 | 100 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT032**

**Estimated Weight of Gold in micrograms: 2.51**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 60 | A |
| 120 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT037**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT041**

**Estimated Weight of Gold in micrograms: 10.27**

| Length in µm | Width in µm | Description |
|---|---|---|
| 280 | 100 | A |
| 60 | 40 | A |
| 60 | 40 | A |
| 60 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT042**

**Estimated Weight of Gold in micrograms: 0.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT047**

**Estimated Weight of Gold in micrograms: 10.23**

| Length in µm | Width in µm | Description |
|---|---|---|
| 220 | 80 | A |
| 160 | 120 | A |
| 120 | 60 | A |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT049**

**Estimated Weight of Gold in micrograms: 4.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 100 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT050**

**Estimated Weight of Gold in micrograms: 2.56**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 100 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT051**

**Estimated Weight of Gold in micrograms: 1.92**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 100 | A |
| 60 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT054**

**Estimated Weight of Gold in micrograms: 0.44**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 40 | A |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT055**

**Estimated Weight of Gold in micrograms: 119.54**

| Length in µm | Width in µm | Description |
|---|---|---|
| 600 | 320 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT056**

**Estimated Weight of Gold in micrograms: 1.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

Sovereign Mining
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT058**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT059**

**Estimated Weight of Gold in micrograms: 1.86**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |
| 100 | 60 | A |
| 60 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT061**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT062**

**Estimated Weight of Gold in micrograms: 5.41**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 120 | I |
| 80 | 40 | R |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT066**

**Estimated Weight of Gold in micrograms: 4.92**

| Length in µm | Width in µm | Description |
|---|---|---|
| 160 | 80 | A |
| 120 | 80 | A |
| 80 | 60 | A |
| 80 | 40 | A |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT067**

**Estimated Weight of Gold in micrograms: 3.25**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 120 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT068**

**Estimated Weight of Gold in micrograms: 25.12**

| Length in µm | Width in µm | Description |
|---|---|---|
| 280 | 180 | A |
| 200 | 140 | I |
| 80 | 80 | A |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT069**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Email: geochem@src.sk.ca

Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT070**

**Estimated Weight of Gold in micrograms: 2.77**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 80 | A |
| 100 | 80 | R |
| 60 | 40 | R |
| 40 | 20 | R |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT071**

**Estimated Weight of Gold in micrograms: 1.96**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT073**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT075**

**Estimated Weight of Gold in micrograms: 10.31**

| Length in µm | Width in µm | Description |
|---|---|---|
| 220 | 160 | A |
| 100 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT077**

**Estimated Weight of Gold in micrograms: 2.1**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT078**

**Estimated Weight of Gold in micrograms: 0.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT079**

**Estimated Weight of Gold in micrograms: 1.31**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |
| 60 | 40 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT080**

**Estimated Weight of Gold in micrograms: 3.77**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 100 | I |
| 100 | 60 | I |
| 100 | 40 | A |
| 80 | 40 | A |
| 60 | 40 | A |
| 60 | 20 | A |
| 40 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT081**

**Estimated Weight of Gold in micrograms: 0.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT082**

**Estimated Weight of Gold in micrograms: 3.41**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 100 | A |
| 100 | 60 | A |
| 80 | 60 | A |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT083**

**Estimated Weight of Gold in micrograms: 14.17**

| Length in µm | Width in µm | Description |
|---|---|---|
| 220 | 140 | A |
| 140 | 80 | A |
| 120 | 80 | A |
| 100 | 80 | A |
| 80 | 80 | A |
| 80 | 60 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT084**

**Estimated Weight of Gold in micrograms: 0.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT085**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 60 | I |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT086**

**Estimated Weight of Gold in micrograms: 1.09**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 60 | A |
| 80 | 40 | A |
| 40 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT088**

**Estimated Weight of Gold in micrograms: 31.86**

| Length in µm | Width in µm | Description |
|---|---|---|
| 300 | 260 | A |
| 120 | 100 | R |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT091**

**Estimated Weight of Gold in micrograms: 0.56**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 40 | A |
| 80 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT094**

**Estimated Weight of Gold in micrograms: 2.17**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 60 | A |
| 80 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT095**

**Estimated Weight of Gold in micrograms: 2.42**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 80 | I |
| 100 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT096**

**Estimated Weight of Gold in micrograms: 6.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 200 | 120 | A |
| 80 | 60 | I |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT100**

**Estimated Weight of Gold in micrograms: 1.27**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 60 | A |
| 80 | 60 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT101**

**Estimated Weight of Gold in micrograms: 13.39**

| Length in µm | Width in µm | Description |
|---|---|---|
| 240 | 180 | A |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT102**

**Estimated Weight of Gold in micrograms: 2.62**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 100 | A |
| 80 | 60 | A |
| 40 | 40 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT103**

**Estimated Weight of Gold in micrograms: 0.56**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 40 | A |
| 80 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT105**

**Estimated Weight of Gold in micrograms: 0.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT106**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT110**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geochem@src.sk.ca
Email: geochem@src.sk.ca

Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT111**

**Estimated Weight of Gold in micrograms: 1.33**

| Length in μm | Width in μm | Description |
|---|---|---|
| 80 | 80 | A |
| 80 | 60 | A |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT116**

**Estimated Weight of Gold in micrograms: 0.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT122**

**Estimated Weight of Gold in micrograms: 0.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT125**

**Estimated Weight of Gold in micrograms: 6.08**

| Length in µm | Width in µm | Description |
|---|---|---|
| 160 | 80 | A |
| 140 | 80 | A |
| 120 | 80 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT126**

**Estimated Weight of Gold in micrograms: 4.97**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 120 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT127**

**Estimated Weight of Gold in micrograms: 5.12**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 120 | A |
| 120 | 120 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT128**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT129**

**Estimated Weight of Gold in micrograms: 2.44**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 60 | A |
| 100 | 60 | A |
| 80 | 60 | A |
| 80 | 40 | A |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT130**

**Estimated Weight of Gold in micrograms: 5.81**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 20 | A |
| 160 | 80 | A |
| 100 | 60 | A |
| 80 | 60 | A |
| 80 | 60 | A |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT133**

**Estimated Weight of Gold in micrograms: 11.56**

| Length in µm | Width in µm | Description |
|---|---|---|
| 220 | 140 | A |
| 140 | 80 | A |
| 100 | 40 | A |
| 80 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT134**

**Estimated Weight of Gold in micrograms: 0.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT135**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 60 | 60 | I |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT136**

**Estimated Weight of Gold in micrograms: 2.52**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 100 | A |
| 80 | 40 | A |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT140**

**Estimated Weight of Gold in micrograms: 121.33**

| Length in µm | Width in µm | Description |
|---|---|---|
| 560 | 360 | A |
| 100 | 80 | A |
| 80 | 60 | A |
| 60 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains..

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT141**

**Estimated Weight of Gold in micrograms: 1.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT142**

**Estimated Weight of Gold in micrograms: 22.81**

| Length in µm | Width in µm | Description |
|---|---|---|
| 280 | 220 | A |
| 100 | 80 | A |
| 60 | 40 | A |
| 40 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT144**

**Estimated Weight of Gold in micrograms: 0.28**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT145**

**Estimated Weight of Gold in micrograms: 85.3**

| Length in µm | Width in µm | Description |
|---|---|---|
| 500 | 280 | A |
| 180 | 180 | A |
| 140 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT146**

**Estimated Weight of Gold in micrograms: 22.96**

| Length in µm | Width in µm | Description |
|---|---|---|
| 260 | 240 | I |
| 100 | 100 | I |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT147**

**Estimated Weight of Gold in micrograms: 1.96**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 100 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT148**

**Estimated Weight of Gold in micrograms: 11.16**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 100 | A |
| 180 | 80 | A |
| 120 | 100 | A |
| 120 | 60 | A |
| 100 | 60 | A |
| 20 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT149**

**Estimated Weight of Gold in micrograms: 6.5**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 120 | A |
| 140 | 120 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT150**

**Estimated Weight of Gold in micrograms: 0.71**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT151**

**Estimated Weight of Gold in micrograms: 8.13**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 120 | A |
| 140 | 100 | A |
| 80 | 60 | I |
| 20 | 20 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT152**

**Estimated Weight of Gold in micrograms: 1.05**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT153**

**Estimated Weight of Gold in micrograms: 0.71**

| Length in µm | Width in µm | Description |
|---|---|---|
| 100 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

July 7, 2004

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

**Sample Number: 03NVT155**

**Estimated Weight of Gold in micrograms: 13.73**

| Length in µm | Width in µm | Description |
|---|---|---|
| 160 | 100 | I |
| 160 | 80 | I |
| 120 | 120 | A |
| 100 | 100 | A |
| 100 | 80 | A |
| 100 | 80 | A |
| 80 | 60 | I |
| 80 | 60 | A |
| 80 | 40 | IA |
| 60 | 60 | I |
| 60 | 40 | A |
| 60 | 40 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

**SRC Geoanalytical Laboratories**
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geochem@src.sk.ca
Email: geochem@src.sk.ca

Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT156**

**Estimated Weight of Gold in micrograms: 1.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 120 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT400**

**Estimated Weight of Gold in micrograms: 1.96**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT403**

**Estimated Weight of Gold in micrograms: 0.46**

| Length in µm | Width in µm | Description |
|---|---|---|
| 80 | 60 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT404**

**Estimated Weight of Gold in micrograms: 1.96**

| Length in µm | Width in µm | Description |
|---|---|---|
| 140 | 80 | A |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser

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Report No: 04-406

**Sovereign Mining**
Attention: Neil Torry
PO #/Project:

July 7, 2004

**Sample Number: 03NVT406**

**Estimated Weight of Gold in micrograms: 6**

| Length in µm | Width in µm | Description |
|---|---|---|
| 180 | 140 | IA |

Delicate (D) - Bedrock gold crystallizes as pitted granular masses with smooth protruding crystals.

Irregular (I) - After short ice transport, crystals are removed leaving smaller pitted grains with several protrusions. Grains may become curled.

Abraded (A) - With increasing transport, protrusions break off irregular grains producing several smaller leaf shaped grains. Pitted surfaces become smooth.

Rounded (R) - results from continued abrasion, producing small polished spherical or ellipsoidal grains.

Please note that combinations of the descriptions may be used if different characteristics within each individual grain are obser