

Solitario Discovers 50.2, 47.7 and 12.2 GPT Gold at Surface on its Golden Crest Project; Expands Land Position

DENVER, CO – February 14, 2021 - Solitario Zinc Corp. (“Solitario”) (NYSE American: XPL; TSX: SLR) is pleased to announce that it has discovered significant high-grade gold at surface on its Golden Crest project in South Dakota. High-grade gold was discovered at the Downpour Zone over an area measuring approximately 170 by 70 meters in extent and open in all directions (see Figure 1 and Table 1 below). To date, Solitario has received assay results for eleven surface reconnaissance grab samples in the central part of the Downpour Zone ([see map](#)). The average gold content for these eleven samples was 12.6 grams per tonne gold (“gpt”), including 50.2, 47.7, 12.2, 8.1, 7.2 and 5.9 gpt gold.

Chris Herald, President and CEO of Solitario, commented: “These initial surface results at Downpour are stunning. In our team’s 40-year history of very successful grass roots exploration, we have never encountered undiscovered gold mineralization with these grades at surface. Equally striking to this evolving story, is the fact that nearly all of the reported Downpour high-grade samples came from rocks exposed in the tracks of a primitive jeep roadbed. This demonstrates the total lack of both modern-day and historical exploration in an area immediately west of the nearby supergiant Homestake-Wharf gold mining district, and strongly suggests that our work to date is literally, just starting to scratch the surface.”

**Table 1: Downpour Assay Results for
Reconnaissance Rock Grab Samples¹**

| Sample Number | Gold gpt | Silver gpt |
|----------------------|--------------|------------|
| 2399 | 12.20 | 8.9 |
| 2400 | 50.20 | 2.6 |
| 2401 | 47.70 | 18.4 |
| 2402 | 0.27 | 16.9 |
| 2403 | 2.82 | 6.5 |
| 2404 | 7.20 | 28.9 |
| 2405 | 1.71 | 2.0 |
| 6055020 ² | 8.13 | <0.1 |
| 6055021 ² | 5.90 | <0.1 |
| 6055022 ² | 0.45 | 1.6 |
| 6055023 ² | 1.65 | <0.1 |

¹Reconnaissance rock grab samples are selective in nature, and therefore reported mineralization and assay results may not be representative nor reflect economic viability.

²Previously reported assay.

Initial assay results for rock sampling at the high-grade Downpour zone were not received until late in the 2021 field season. Consequently, work was suspended in early December before we could complete another phase of evaluation. However, we were able to collect 14 additional rock samples and 24-meters of channel sampling,

before weather forced the cessation of activities. We anticipate reporting these results within the next few weeks.

14 Target Zones Discovered to Date

In addition to the Downpour zone, Solitario has identified another 13 separate zones of gold-bearing mineralization (see Table 2), many of which contain surface gold grades in excess of 1.0 gpt gold. Nine of these zones are clustered within an area measuring seven by five kilometers in size. Based on these results, and our ongoing exploration program, Solitario has expanded its mineral claim position from approximately 21,300 acres to nearly 28,000 acres of mineral rights, or 44 square miles (113 square kilometers).

Table 2: Gold Summary Statistics for Rock Samples

| Prospect | No of Samples | Au ppb (max) | Au ppb (avg)* | Ag ppm (max) |
|-------------------------|----------------------|---------------------|----------------------|---------------------|
| Buena Vista | 24 | 3246 | 215 | 0.8 |
| Yellow Jacket | 26 | 132 | 33 | 0.8 |
| Shoofly-Fireball | 42 | 64 | 18 | 2.7 |
| Treasure Vault | 44 | 3990 | 516 | 3 |
| Matchstick | 119 | 8740 | 480 | 1.8 |
| Whirlwind | 167 | 7990 | 399 | 1040 |
| Citadel | 60 | 30 | 13 | 11 |
| 11th Hour Gulch | 12 | 10 | 7 | 0.2 |
| Maurice | 10 | 349 | 85 | 2 |
| Lockout | 6 | 61 | 25 | 11.8 |
| Downpour | 16 | 50200 | 8677 | 28.9 |
| Log Jam | 10 | 807 | 198 | 2.2 |
| Dustbowl | 7 | 62 | 62 | 0.7 |
| Land's End | 21 | 323 | 96 | 0.7 |

ppb = parts per billion; 1,000 ppb = 1.0 gram

*of samples with detectable gold

Rock and Soil Sampling Program

During the 2021 field season, Solitario collected 972 reconnaissance grab samples of rock and 5,575 soil samples (B-horizon). At Golden Crest there is almost a total lack of outcropping rocks, but generally, there is less than 30 centimeters of soil cover on top of sub-crop and bedrock. Consequently, sampling bedrock is difficult, but soils provide an excellent alternative medium to sample. Solitario's work to date has defined multiple areas of significant anomalous trace elements. Many of these anomalous areas have been found to correlate well with gold-bearing rocks, float or sub-crop.

2022 Work Program

The 2022 exploration program will be one of the most active programs in Solitario's history. Besides the 14 gold prospects that have been defined to date, there remain multiple large areas displaying significant trace element concentrations in soils that have never been prospected, sampled for gold-bearing rocks or evaluated by a geologist. Additional sampling and geologic evaluation of these anomalous areas will be one of Solitario's primary activities for the 2022 work program. With less than 20% of Solitario's land position having been soil sampled or prospected for mineralized rocks, significant additional sampling is also planned for 2022.

Other important work scheduled for 2022 is geophysical surveying of select target areas, permitting drilling sites, and drilling (permitting dependent).

Chris Herald, President and CEO of Solitario, commented further, “The results of our 2021 exploration work at Golden Crest strongly supports our belief that a large gold endowment could exist at depth in limestone covered terrain west of the Super Giant Homestake-Wharf gold district. We are excited about our planned 2022 exploration program and are confident that multiple new high-quality drill targets will be identified. Collecting multi-gram gold samples in the shadow of a +70-million-ounce gold district, in an area with virtually no evidence of any past exploration, is truly remarkable. We firmly believe that the Golden Crest project could emerge into one of the most important greenfield exploration projects in North America.”

Sampling Methodology, Chain of Custody, Quality Control and Assurance

The collection of all surface rock samples was supervised by project geologists, including chain of custody. Rock samples were reconnaissance select grab samples that display alteration, usually silicification and hydrothermal brecciation. These samples were derived mainly from residually weathered rock fragments, sub-crop, and less commonly, outcrop. The significance of these samples is limited to determining whether gold, or trace elements usually associated with gold, are present within rocks affected by hydrothermal alteration fluids and assay results may not be representative of, nor verify economically mineable mineralization at depth. Samples were analyzed by Skyline Assayers & Laboratories in Tucson, AZ, a laboratory accredited in accordance with the standards of ISO 17025:2017. The samples were crushed and pulverized, and sample pulps were analyzed using industry standard fire assay methods. A certified reference sample or duplicate was inserted at least every 20th sample.

Walter Hunt, COO of Solitario, is a qualified person as defined by NI 43-101, Standards of Disclosure for Mineral Projects, responsible for approving the scientific and technical information contained in this news release.

Golden Crest Property

The 28,000-acre Golden Crest property is located in southwestern South Dakota. Solitario’s property position constitutes a 100%-owned strategic land position along the western extension of the Homestake-Wharf mining district that has produced well in excess of 55 million ounces of gold with another 20-30 million ounces in historical resources. Approximately 60% of the land position is subject to a mining lease with a private party. The project area is in a safe jurisdiction with highly developed infrastructure, an unbroken 145-year record of continuous gold mining, a skilled mining workforce, and a history of high-grade, underground mineable gold deposits.

About Solitario

Solitario is a natural resource exploration and development company focused on high-quality Tier-1 gold and zinc projects. The Company is traded on the NYSE American (“XPL”) and on the Toronto Stock Exchange (“SLR”). In addition to its Golden Crest project, Solitario holds 50% joint venture interest (Teck Resources 50%) in the high-grade, open-pit table Lik zinc deposit in Alaska and a 39% joint venture interest (Nexa Resources holds the remaining 61% interest) on the high-grade Florida Canyon zinc project in Peru. Solitario is carried to production through its joint venture arrangement with Nexa. Solitario’s Management and Directors hold approximately 9.3% (excluding options) of the Company’s 62 million shares outstanding. Solitario’s cash balance and marketable securities stand at approximately US\$6.7 million. Additional information about Solitario is available online at www.solitariozinc.com.

Solitario has a long history of a commitment to Environmental, Social and Responsible Governance (“ESG”) of its business. We realize ESG issues are also important to investors, employees and all stakeholders. We are pledged to operate our business in a manner that supports environmental and social initiatives and responsible corporate governance.

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Cautionary Statement Regarding Forward Looking Information

This press release contains forward-looking statements within the meaning of the U.S. Securities Act of 1933 and the U.S. Securities Exchange Act of 1934, and as defined in the United States Private Securities Litigation Reform Act of 1995 (and the equivalent under Canadian securities laws), that are intended to be covered by the safe harbor created by such sections. Forward-looking statements are statements that are not historical facts. They are based on the beliefs, estimates and opinions of the Company's management on the date the statements are made and address activities, events or developments that Solitario expects or anticipates will or may occur in the future, and are based on current expectations and assumptions. Forward-looking statements involve a number of risks and uncertainties. Consequently, there can be no assurances that such statements will prove to be accurate and actual results and future events could differ materially from those anticipated in such statements. Solitario's Golden Crest land position does not cover any of the areas of historical gold production or historical unmined resources. Certain historical information concerning exploration and gold production in the Black Hills region has been obtained through both public and private sources and are believed to be substantially factual, but Solitario can give no assurances of the accuracy of such information. The existence of historic mines and resources adjacent to Solitario's land position do not necessarily support the existence economic mineral deposits on Solitario's land position. Such forward-looking statements include, without limitation, statements regarding the Company's expectation of the projected timing and outcome of engineering studies; expectations regarding the receipt of all necessary permits and approvals to implement a mining plan, if any, at any of its mineral properties; the potential for confirming, upgrading and expanding gold, zinc, lead and silver mineralized material; future operating and capital cost estimates may indicate that the stated resources may not be economic; estimates of zinc, lead and silver grades of resources provided are predicted and actual mining grade could be substantially lower; estimates of recovery rates could be lower than estimated for establishing the cutoff grade; and other statements that are not historical facts could vary significantly from assumptions made in the PEA for the Florida Canyon zinc project. Although Solitario management believes that its expectations are based on reasonable assumptions, it can give no assurance that these expectations will prove correct. Important factors that could cause actual results to differ materially from those in the forward-looking statements include, among others, risks relating to risks that Solitario's and its joint venture partners' exploration and property advancement efforts will not be successful; risks relating to fluctuations in the price of zinc, gold, lead and silver; the inherently hazardous nature of mining-related activities; uncertainties concerning reserve and resource estimates; availability of outside contractors, and other activities; uncertainties relating to obtaining approvals and permits from governmental regulatory authorities; the possibility that environmental laws and regulations will change over time and become even more restrictive; and availability and timing of capital for financing the Company's exploration and development activities, including uncertainty of being able to raise capital on favorable terms or at all; risks relating to the impacts of Covid-19 or similar variants; as well as those factors discussed in Solitario's filings with the U.S. Securities and Exchange Commission (the "SEC") including Solitario's latest Annual Report on Form 10-K and its other SEC filings (and Canadian filings) including, without limitation, its latest Quarterly Report on Form 10-Q. The Company does not intend to publicly update any forward-looking statements, whether as a result of new information, future events, or otherwise, except as may be required under applicable securities laws.