S-K 1300 Technical Report Summary,
Lik Project

Northwest Arctic Borough, Alaska, USA

Prepared for:

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1 Executive Summary

This Technical Report Summary (TRS) was prepared for Solitario Zinc Corp. (Solitario) by WSP USA Inc. (WSP) for the Lik Project. The Lik Project is a joint venture exploration program focused on the Lik zinc and lead deposit located in Northwestern Alaska. The purpose of this TRS is to report a mineral resource under the United States Securities and Exchange Commission (SEC) S-K 1300 regulations.

The basis for the reporting of resources is a Preliminary Economic Assessment issued on April 23, 2014, prepared by JDS Energy & Mining, Inc. The Qualified Persons of this TRS have audited this previous work and found it acceptable for reporting mineral resources.

1.1 Property Summary and Ownership

Solitario is a United States based minerals exploration company that owns a 50% interest in the Lik Project. Teck American Inc. (Teck) holds the other 50% interest in the Lik Project. The Lik Project is located 145 km north of Kotzebue and 19 km northwest of the Teck Red Dog Mine at the coordinates of 68.17 degrees north, 163.20 degrees west. The project consists of 47 contiguous State of Alaska mining claims.

1.2 Mineral Resource Statement

This sub-section contains forward-looking information related to the mineral resource estimates for the Project. The material factors that could cause actual future results to differ materially from the conclusions, estimates, designs, forecasts or projections in the forward-looking information include any significant differences from one or more of the factors or assumptions that are set forth in this sub-section including geological and grade interpretations, controls, and forecasts associated with establishing the prospects for economic extraction.

Mineral resources that are not mineral reserves do not have demonstrated economic viability. The mineral resource statement includes inferred mineral resources which are considered too speculative geologically to have economic considerations applied to them that would allow the categorization of the inferred resource as a mineral reserve. There is no certainty that any of the mineral resources will convert to mineral reserves. The mineral resource statement includes only resources inside an optimization shell.

Table 1-1 Mineral Resources

Location	Indicated Resources				Inferred Resources			
	Mt	% Zn	% Pb	g/t Ag	Mt	% Zn	% Pb	g/t Ag
Lik South	17.1	8.04	2.69	50.0	0.71	7.78	1.97	14.3
Lik North	0.51	8.95	2.46	52.9	2.09	8.93	2.98	47.2
Total	17.6	8.07	2.68	50.1	2.80	8.64	2.73	38.9

1.3 Geology and Mineralization

The Lik deposit is hosted in the upper part of the Ikalukrok Unit of the Kuna Formation. The immediate host rocks are carbonaceous and siliceous black shale, with subordinate black chert and fine-grained limestone. There is little outcrop or exposure of the host rocks on site, but they are interpreted to strike broadly north-south and dip at approximately 25 to 40 degrees to the west. The massive sulfides are overlain conformably by rocks of the Siksikpuk Formation. The sequence is overridden by allochthonous rocks that form hills north and west of the deposit.

1.4 History and Exploration

The history of the Lik Project begins in the 1970s when the U.S. Bureau of Mines published a mineral assessment for northwestern Alaska. This was followed by the staking of claims in the Lik Creek area and the first exploration drilling in the area in 1977. Several joint ventures explored the property during the 1970s through 1992. Zazu Mineral Corp. acquired a 50% interest in the property and began drilling in 2007 followed by metallurgical testing. Solitario acquired the property through a corporate merger with Zazu in 2017.

1.5 Metallurgy and Mineral Processing

A total of 5 metallurgical studies have been conducted for the Lik Property. The envisioned concentration process for the Lik Project is conventional flotation. The potential concentrates would be shipped via truck to existing port facilities on the Chukchi Sea. Table 1-2 Indicates the results of the flotation test work and the mass and recovery figures used in the calculation of cutoff grade.

Table 1-2 Metallurgical Test Results

Element	Feed	Lead Concentrate		Zinc Concentrate	
	Grade	Grade	Recovery	Grade	Recovery
Pb %	2.60	61.2	69.7	1.73	9.6
Zn %	9.02	5.78	2.06	53.4	85.0
Ag g/t	36	62	5.2	66	26.8

1.6 Mineral Resource Estimates

A block model was developed by Roscoe Postle Associates (RPA) for a previous technical report on mineral resources published in 2012. The same block model was also the basis for the 2014 Preliminary Economic Assessment (2014 PEA). This block model, and accompanying exploration and estimation data, was audited by the Qualified Person and accepted for use in this mineral resource statement. Grade interpolation for the estimation was ordinary kriging and interpolation was completed as a two-pass process. A density of 3.5 g/cm^3 was used for mineralized material. The mineral resource is reported at a cutoff grade inside a pit optimization shell.

1.7 Conclusions and Recommendations

The Lik project contains an indicated resource of 17.6 million tonnes at an average grade of 8.07 %Zn and 2.68 %Pb. These resources have a reasonable economic potential for extraction via typical surface mining methods and processed into a marketable concentrate using standard flotation concentration processes. Solitario owns a 50% interest in the Lik property and continues to work with Teck under a joint operating agreement to continue to maintain and explore Lik.

The Lik Project is subject to risks and uncertainties typical of mineral exploration projects, particularly risk regarding commodity prices and the metals equity markets. Lower than forecasted metals prices or lack of equity market interest or activity could render the project uneconomic or reduce access to project financing.

Specific risks to additional project exploration and subsequent mine development include the ability to successfully permit exploration and development activities, to maintain a social license with the local peoples to continue to operate and explore the property, and to successfully develop an operation in the arctic conditions.

There is exploration potential located on the Lik Project and the opportunity exists to improve the classification of the current resource and add additional resources. Recent exploration campaigns suggest additional mineralization may be present in the western area of the current mineral claim holdings, which represents an opportunity for additional exploration.

Work Plan for 2022

It is recommended in the short term that exploration be conducted over unexplored areas on the property including:

- Complete geophysical surveys over the entire land position.
- Continue geologic mapping to use for interpretation of prospective areas for drilling and use in conjunction with geophysics to prioritize targets.
- Drilling.
- Interpretation of exploration results and update the estimation of resources.

This exploration strategy will be an integral part of the long-term objective of development of Lik. Ultimately the preparation of a feasibility study will be required in order to reach a production decision. This will require substantial investment in additional resource definition drilling, metallurgical studies and a multitude of other technical work that will require design and approval by the JV partners.

Three of the short-term exploration elements discussed above are incorporated in the approved 2022 exploration program. The 2022 program includes continued geologic mapping, geophysical surveying and drilling of three core holes totaling 650 meters for an estimated program cost of US$1.168 M of which 50% will be Solitario's responsibility.

2 Introduction

2.1 Terms of Reference and Purpose of the Report

This Technical Report Summary is prepared for Solitario Zinc Corporation (Solitario) for the purposes of reporting mineral resources at the Lik Property. Solitario owns a 50% interest in the Lik Project with the other 50% interest owned by Teck Resources Limited (Teck). Solitario is currently participating in a joint venture with Teck to explore and develop the Lik Project.

The purpose of this Technical Report Summary (TRS) is to report a mineral resource under the United States Securities and Exchange Commission (SEC) standards for reporting of resources in 17 CFR part 229.1300, commonly referred to as the S-K 1300 regulations. The estimation and reporting of resources and reserves herein is in conformance with Solitario standards and international mining best practices.

The published date of this TRS Report is March 11, 2022. The effective date of this TRS is December 31, 2021. It is the Qualified Persons' opinion that there are no material changes to the project between the effective and published dates of this report.

Unless otherwise indicated, the following apply to this TRS:

- Metric units of measure
- Constant US Dollars as of January 2022
- Grades are presented in weight percent

2.2 Source of Data and Information

The preparation of this TRS required the compilation of data from both public and private sources. An exploration database and previous Technical Reports were provided by Solitario's technical personnel. References used in the production of this TRS are provided in Section 24. A detailed list of data relied upon and provided by the registrant is available in Section 25.

2.3 Details of Inspection

In consideration of the potential health risks associated with the current COVID pandemic for both the authors and the indigenous populations of the project area, the authors of this report have not completed a site visit to the property. Additionally, the travel polices of WSP USA, Solitario and Teck during the production of this TRS did not allow for travel to the site.

2.4 Previous Reports on Project

This report is the first Technical Report Summary produced for the Lik Project, prepared under the new property disclosure requirements for mining registrants required by the SEC. Previous to this report, on behalf of Zazu Metals Corp, (fully acquired by Solitario) JDS Energy and Mining Inc prepared a Preliminary Economic Assessment (PEA) on the Lik Project under Canadian National Instrument 43-101 (NI 43-101) which adhered to Canadian Institute of Mining Metallurgy and Petroleum (CIM) standards. Below are the most recent Technical Reports:

- "Preliminary Economic Assessment, Technical Report Zazu Metals Corporation, Lik Deposit Alaska, USA" Effective Date: March 3, 2014. Prepared by JDS Energy and Mining Inc.
- "Technical Report and Mineral Resource Estimate for the Lik Project, Northwestern Alaska, U.S.A." Effective Date: June 12, 2012. Prepared by Roscoe Postle Associates Inc.

3 Property Description and Location

3.1 Location

The Lik Project is in the Northwest Arctic Borough of Alaska in the De Long Mountains of the Brooks Range. It is located at 68°10'N and 163°12' W. It is approximately 19 km northwest of the Red Dog Mine, operated by Teck Alaska, Inc. (Teck), or 145 km northwest of Kotzebue, which has the closest commercial airport. The approximate location is shown in Figure 3-1. The property is jointly owned by Solitario (50% interest) and Teck (50% interest).

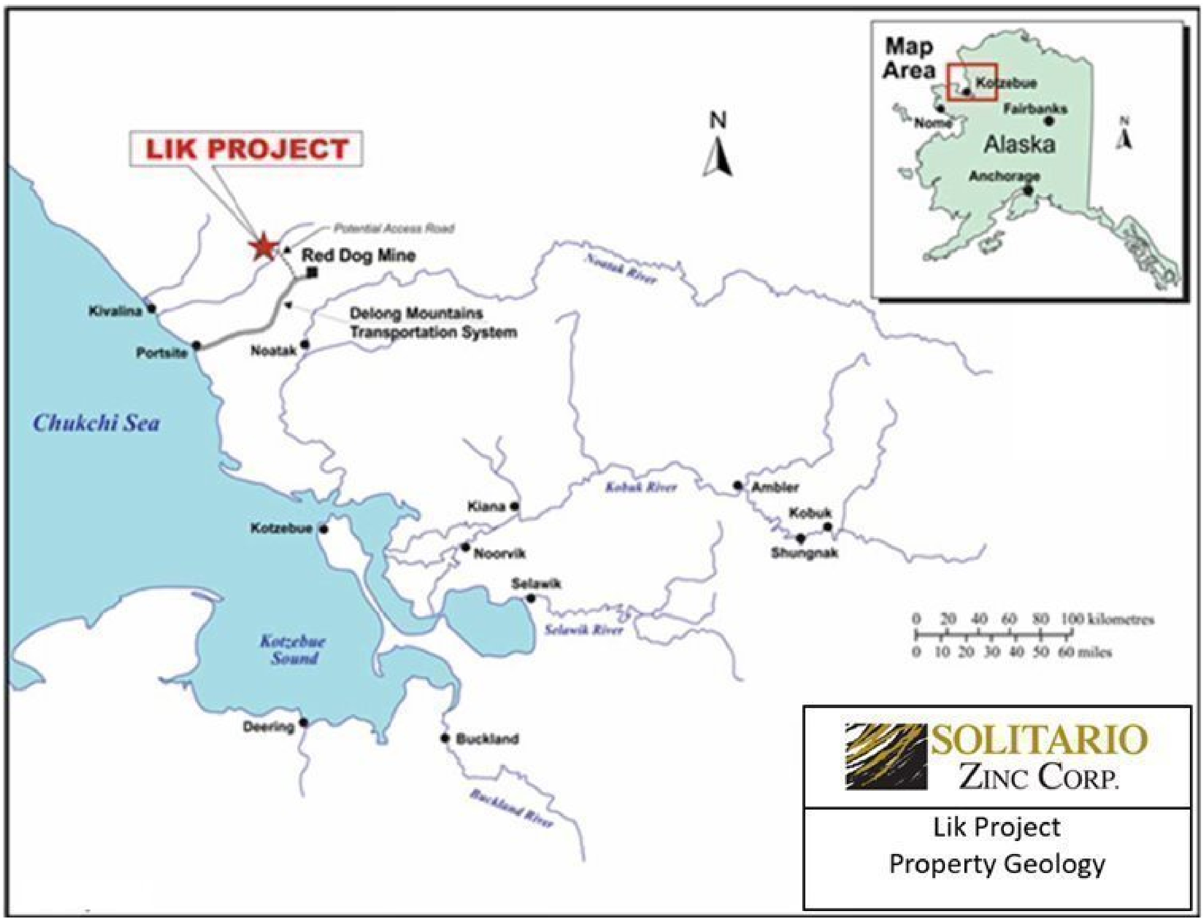

Figure 3-1: Lik Location Map (Modified from 2014 PEA)

3.2 Mineral Titles, Claims, Rights, Leases and Options

The Lik property consists of 47 contiguous Alaska State Mining claims as detailed in Table 3-1 and the mineral claim map shown in Figure 3-2. The approximate area of these claims is 2,460 ha. The majority of the mineral claim area resides in Township 32N, Range 20W of the Kateel River Meridian, State of Alaska. All 47 claims are controlled by both Solitario and Teck controlling an equal interest.

The Lik Property was originally staked as unpatented federal mining claims within the area indicated as Lik Block Claim in green on Figure 3-2. Ownership of the area was transferred from the federal government to the State of Alaska, and in 2013 the federal mining claims were extinguished and State of Alaska mining claims were issued. The State of Alaska claims have been surveyed to avoid conflict with adjacent mineral rights owners.

Surface rights above the mineral claims are under the authority of the State of Alaska. The State requires an annual rental payment for which Solitario's 50% share was $5,460 for 2022.

On July 12, 2017, Solitario acquired Zazu Metals Corporation which owned 50% of the Lik Project. As a result of the acquisition, Zazu became a wholly owned subsidiary of Solitario. Prior to the merger, Zazu Metals Corporation had purchased the Lik project from GCO Minerals company in 2007 and GCO retained a 2% net proceeds interest. GCO owns an additional 1% net proceeds from a separate 1997 agreement.

The Company is participating in the exploration and possible development of the Lik property through a joint venture with Teck. The terms of the joint venture were governed by the Lik Block Agreement, signed on January 27, 1983, between Houston Oil & Minerals Exploration Company ("HOMEX") and GCO. HOMEX assigned its interest in the Lik Block Agreement to Echo Bay Mines Ltd., which, in turn, assigned such interest to Teck. The Lik Block Agreement terminated on January 27, 2018 and the joint venture has since been governed a Joint Exploration Agreement (JEA). Since 2018, Teck and Solitario have agreed to annual exploration funding to advance the Lik project. The JOA requires unanimous approval by the parties for annual expenditures in excess of $1 million. Solitario is the operator of the joint venture. Solitario and Teck each retain a 50% interest in the Lik property.

Teck has acted as manager of the exploration programs for the past four years. The Company and Teck have approved a plan and budget for exploration in 2022 which includes continued geologic mapping, geophysical surveying and drilling of three core holes totaling 650 meters for an estimated program cost of US$1.168 M of which 50% will be to Solitario's account.

Table 3-1 State of Alaska Claim Names

Claim Names	ADL Serial Number	Document Number
LIK-MTR1	638926	2001-001013-0
LIK-MTR2	638927	2001-001014-0
LIK-MTR3	638928	2001-001015-0
LIK-MTR4	638929	2001-001016-0
LIK-MTR5	638930	2001-001017-0
LIK-MTR6	638931	2001-001018-0
LIK-MTR7	683932	2001-001019-0
LIK-MTR8	683933	2001-001020-0
LIK-MTR9	683934	2001-001021-0
LIK-MTR10	683935	2001-001022-0
LIK-MTR11	683936	2001-001023-0
LIK-MTR12	683937	2001-001024-0
LIK-MTR13	683938	2001-001025-0
LIK-MTR14	683939	2001-001026-0
LIK-MTR15	683940	2001-001027-0
LIK-MTR16	683940	2001-001028-0
LIK-MTR17	683942	2001-001029-0
LIK-MTR18	683943	2001-001030-0
LIK-MTR19	683944	2001-001031-0
LIK-MTR20	683945	2001-001032-0
LIK-MTR21	683946	2001-001033-0
LIK-MTR22	683947	2001-001034-0
LIK-MTR23	683948	2001-001035-0
LIK-MTR24	683949	2001-001036-0
LIK-MTR25	683950	2001-001037-0
LIK-MTR26	683951	2001-001038-0
LIK-MTR27	683952	2001-001039-0
LIK-MTR28	683953	2001-001040-0
LIK-MTR29	683954	2001-001041-0
LIK-MTR30	683955	2001-001042-0
LIK-MTR31	683956	2001-001043-0
LIK-MTR32	683957	2001-001044-0
LIK-MTR33	683958	2001-001045-0
LIK-MTR34	683959	2001-001046-0
LIK-MTR35	683960	2001-001047-0
LIK-MTR36	683961	2001-001048-0
LIK-MTR37	683962	2001-001049-0
LIK-MTR38	683963	2001-001050-0
LIK-MTR39	683964	2001-001051-0
LIK-MTR40	683965	2001-001052-0
LIK-MTR41	683966	2001-001053-0
LIK-MTR42	683967	2001-001054-0
LIK-MTR43	683968	2001-001055-0
LIK-MTR44	683969	2001-001056-0
LIK-MTR45	683970	2001-001057-0
LIK-MTR46	683971	2001-001058-0
LIK-MTR47	683972	2001-001059-0

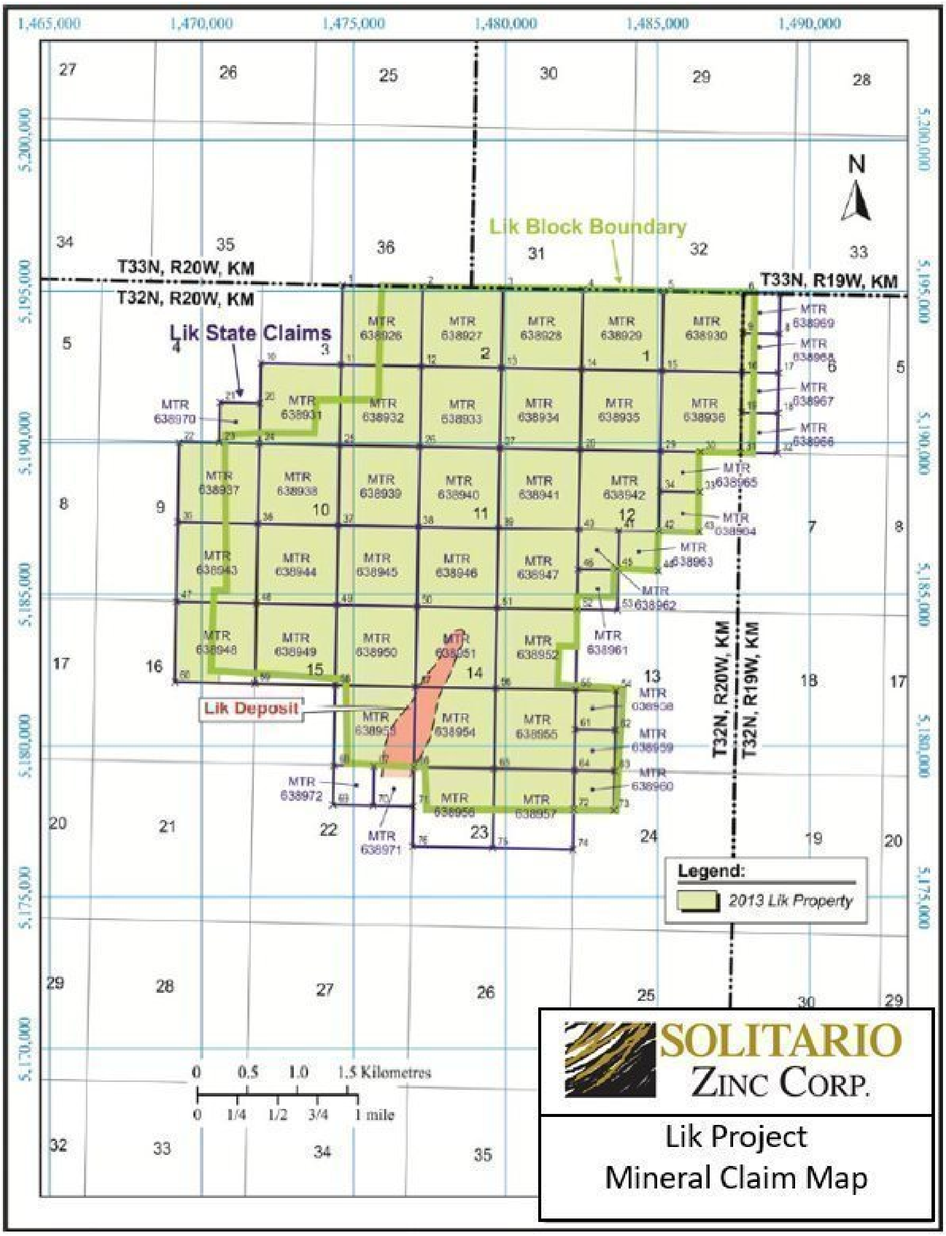

Figure 3-2: Lik Property Map (modified from 2014 PEA)

3.3 Environmental Impacts and Permitting

Teck is permitting drill holes on the Lik property for 2022. Permitting is in close coordination with the local communities.

The Lik project has a field camp on site at the property that was constructed by Zazu metals during their drilling programs. Solitario carries a License and Permit Bond for $250,000 against reclamation liability for future remediation of the site.

3.4 Other Significant Factors and Risks

Guess and Rudd Law Offices of Anchorage, AK completed a title report for the Lik Property in 2007. The title report confirmed the ownership of the interest in the Lik Property by Zazu Minerals Corp, which is currently a wholly owned subsidiary of Solitario.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, Elevation and Vegetation

The Lik Project is in the DeLong Mountains, located within the western Brooks Range of Alaska. The area is characterized by steep angular mountains cut by streams and rivers. The project site sits at approximately 250 meters above sea level.

The site can be broadly classified as woody tundra consisting of lichen, grasses, and low brush. Vegetation within the project area includes mixed shrub-sedge tussock tundra with willow thickets along rivers and streams. Alpine tundra is predominant at higher elevations and ridge crests. The project site is north of the Arctic treeline.

4.2 Accessibility and Transportation to the Property

Access to the property is via chartered aircraft. There is an airstrip located on the property. The town of Kotzebue is located 145km to the south of the deposit which is serviced by a seaport and airport. Teck's Red Dog mine nearby has a paved airstrip and helipad. Helicopter access to the property is the most common form of transportation for field workers.

4.3 Climate and Length of Operating Season

Climate for the area can be characterized by data from Kotzebue, nearby. The National Weather Service 2021 temperature data overlaid with the historical range is shown in Figure 4-1. Temperatures can range from approximately 75°F in the summer to -50°F in the winter. Precipitation accumulation data is shown in Figure 4-2. Precipitation in the area ranges from 5 to 16.5 inches.

Given the extreme low temperatures in the winter months, the operating season for diamond drilling at Lik is from about June 1 to November 15, when surface water can be used for the needs of drills and the camp.

The nearby Red Dog mine operates year-round, however the concentrate shipment from its port is restricted to the three ice-free summer months. Winter months present issues with oceanic ice that make sea access unnavigable.

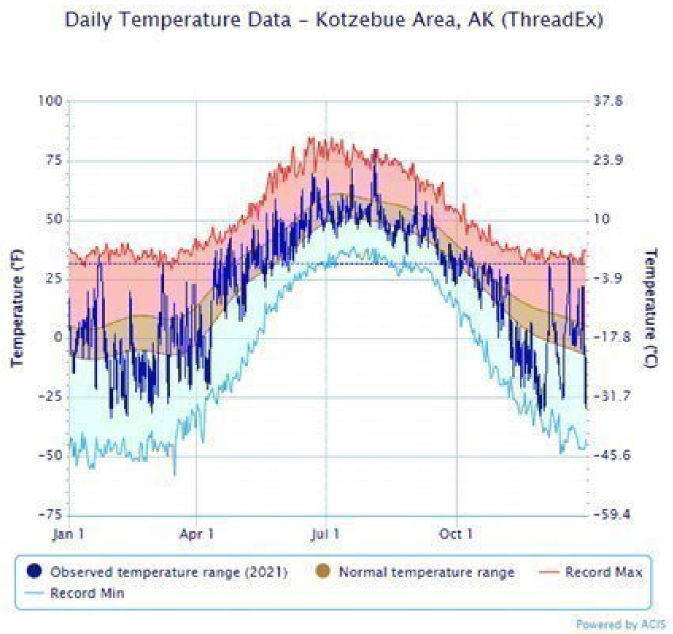

Figure 4-1:National Weather Service Temperature Data

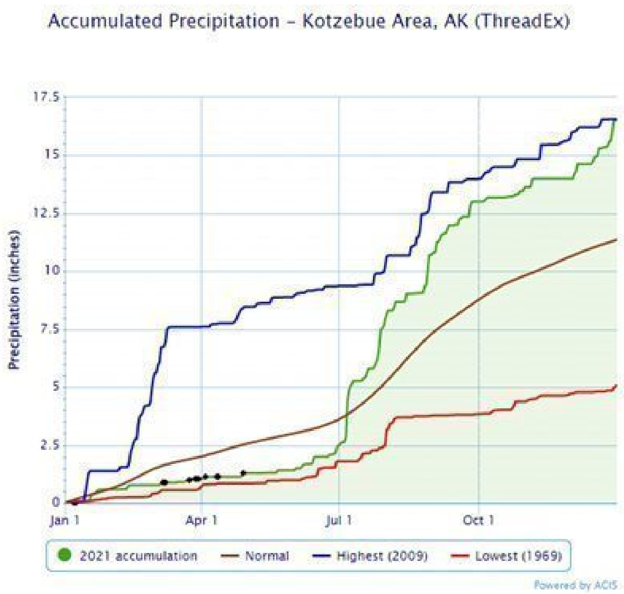

Figure 4-2: National Weather Service Accumulated Precipitation Data

4.4 Infrastructure Availability and Sources

Current infrastructure on the Lik property include an exploration camp and 1300m by 30m gravel airstrip. The project currently has camp facilities for employees. Medical facilities are available in Kotzebue, however due to the remoteness a medical response team would be needed in case of emergency.

The Red Dog mine, operated by Teck, has a large camp, mill, warehouse, maintenance shops, mine, air strip and hanger for commercial size aircraft. The Red Dog Mine is located about 20 km from the Lik Property. While the above infrastructure is not part of the Lik Property it may be available for use by agreement with Teck.

A road from the Red Dog Mine to the port called the Delong Mountains Transportation System is available for use. A 25km access road would be required to connect the Lik Property to the above road.

In case of future development of Lik, the seaport used by the Red Dog mine has a shipping season of about 100 days. This would require storage provisions for supplies and concentrates to facilitate production. The local population of native American Villages is approximately 3,000.

5 History

The Lik Project resides in an area of mineral potential identified in 1970 by Mr. I. Tailleur, who was mapping in the De Long Mountains area on behalf of the United States Geological Survey (U.S.G.S.). In 1975, attention was redrawn to this deposit by the U.S. Bureau of Mines, which was carrying out a mineral assessment in northwest Alaska. The 1975 announcement precipitated a staking rush throughout the De Long Mountains.

5.1 Prior Ownership

GCO Minerals Company (GCO), New Jersey Zinc Company (NJZ) and WGM Inc. (WGM) formed the WAK Joint operating agreement and started exploring and staking claims in the De Long Mountains. The group carried out stream geochemical sampling and reconnaissance. Claims were staked in July 1976 to protect a stream geochemical anomaly on Lik Creek. Houston Oil and Minerals Exploration Company (HOMEX) replaced NJZ in the joint venture in 1976-77.

The WAK Joint Operating Agreement was superseded by the Lik Block Agreement which was agreed to on January 27, 1983, between Houston Oil & Minerals Exploration Company (HOMEX) and GCO. HOMEX assigned its interest in the Lik Project to Echo Bay Mines Ltd., which in turn, assigned the interest to Teck. GCO assigned its interest in the Lik Project to Zazu Metals Corporation in 2007. In 2017, Solitario acquired Zazu Metals.

5.2 Prior Work

Diamond drilling commenced in 1977 and targeted a gossan with a coincident soil and electromagnetic anomaly. The first hole encountered massive lead-zinc-silver-bearing sulphides. By the end of 1977, the joint venture had completed 40 line-kilometres of ground geophysics, a soil sampling program, and ten diamond drill holes with an aggregate depth of 1,603 m. In 1978, further geological, geochemical, and geophysical surveys were carried out, together with the drilling of another 79 diamond drill holes aggregating 10,680 m. A further 14 diamond drill holes with a total depth of 4,931 m were completed in 1979 and a mineral resource was estimated.

In 1984, Noranda Exploration, Inc. (Noranda) optioned the Lik property. Much of the Noranda activity was concentrated in the Lik North area where ten diamond drill holes with an aggregate depth of 4,180.3 m were completed on four sections. Noranda also drilled holes in the Lik South deposit to better define “mineable high-grade reserves”. Noranda dropped its interest in the Lik property after a reorganization of its holdings in the United States.

Moneta Porcupine Mines Inc. (Moneta) optioned the property in 1990 and together with GCO, completed three diamond drill holes aggregating 263 m. The purpose of the Moneta drilling was to obtain metallurgical samples, but no records of any significant Moneta metallurgical work have been located. GCO drilled two additional diamond drill holes in 1992. There was no further drilling until Zazu acquired the property and commenced the drilling program in 2007.

Diamond drill campaigns through 2022 are summarized in Table 5-1.

Table 5-1: Diamond Drilling Campaigns through 2022

Year	Number of Holes	Aggregate Depth (m)	Company
1977	10	1,603	Managed by WGM
1978	79	10,680	Managed by WGM
1979	14	4,931	Managed by GCO
1980	3	202	Managed by GCO
1983	1	835	Managed by GCO
1984	6	1,643	Managed by GCO
1985	16	4,883	Managed by Noranda
1987	1	697	Managed by GCO
1990	3	263	Managed by Moneta
1992	2	284	Managed by GCO
2007	11	1,394	Managed by Zazu
2008	57	6,830	Managed by Zazu
2011	24	3,811	Managed by Zazu
Total	**229**	**38,201**	

There have been several mineral resource estimates in the past, however, these have been superseded by the current resource estimate in this report.

6 Geological Setting, Mineralization and Deposit

The information in this section was assembled by JDS Mining and Energy for the 2014 PEA. The authors of this report know of no new material data that would affect the understanding of the geology in and around the Lik Project and believe that the geological data and interpretation presented continue to be indicative of the Lik Project.

6.1 Regional Geology

The regional geology of the Western Brooks Range area is structurally complex. The sedimentary rocks of the area have been disrupted by thrust sheets or allochthons (Dumoulin et al., 2004) (Figure 6-1). The Lik deposit and the other zinc-lead deposits of the Brooks Range, including Red Dog, are hosted in the Kuna Formation of the Lisburne Group (Figure 6-2). In the Western Brooks Range, the Lisburne Group includes both deep and shallow water sedimentary facies and local volcanic rocks. The rocks have been extensively disrupted by thrusting. The deep-water facies of the Lisburne Group, the Kuna Formation, is exposed chiefly in the Endicott Mountains and the structurally higher Picnic Creek allochthons.

In the Red Dog plate of the Endicott Mountains allochthon, the Kuna Formation consists of at least 122 m of thinly interbedded calcareous shale, calcareous spiculite, and bioclastic supportstone (the Kivalina Unit) overlain by 30 m to 240 m of siliceous shale, mudstone, calcareous radiolarite, and calcareous lithic turbidite (the Ikalukrok Unit). The Ikalukrok Unit in the Red Dog plate hosts all of the known massive sulphide deposits in the area. The Ikalukrok Unit is carbonaceous, is generally finely laminated, and contains siliceous sponge spicules and radiolarians. Based on conodonts and radiolaria, the Kuna Formation is Osagean to Chesterian (late Early to Late Mississippian). The unit is thought to have formed in slope and basin settings characterized by anoxic or dysoxic bottom water.

The structural complexity of the Western Brooks Range resulted from Mesozoic convergence followed by further shortening in the Tertiary period. Young (2004) notes that the reconstructed Kuna Basin is a 200 km by more than 600 km feature.

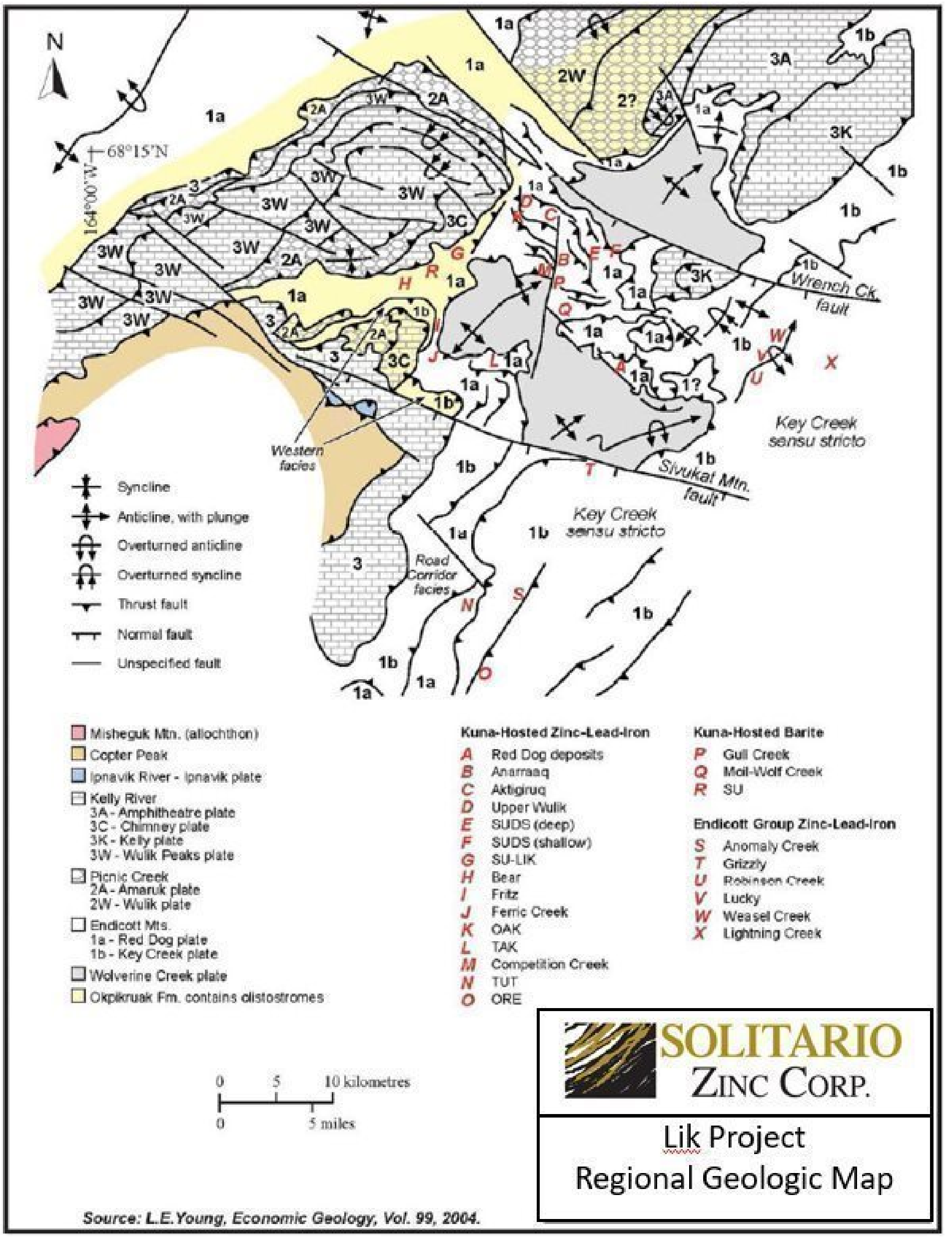

Figure 6-1: Regional Geologic Map

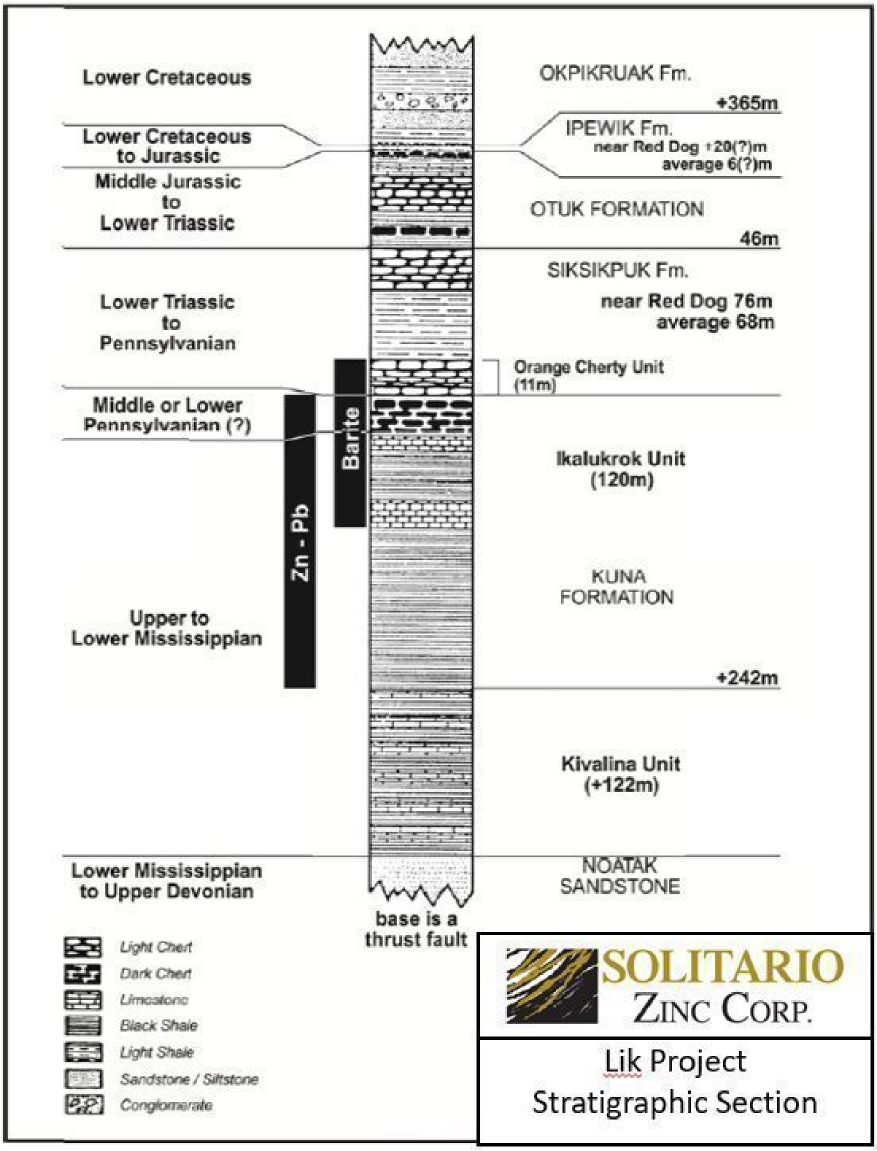

Figure 6-2:Kuna Formation Stratigraphy

6.2 Local Geology

The Lik deposit is hosted in the Red Dog plate of the Endicott Mountains allochthon (Young, 2004). The term "allochthon" describes an assemblage of stratigraphically related rocks that overlies a large displacement thrust fault. The stratigraphically lowest rocks within the Red Dog plate belong to the Kayak Shale. The top of the Kayak Shale is interbedded with rocks of the Kuna Formation.

The Kuna Formation is divided into two units, the Kivalina Unit and the Ikalukrok Unit. In a district sense, the Kivalina Unit is up to 122 m thick and may have been deposited in a local fault-bounded depression. It includes laminated, black calcareous shale and thick-bedded, grey micritic limestone, grainstone, and packstone. The Ikalukrok Unit varies in thickness across the district from 29 m to greater than 240 m. The unit has been divided into a lower laminated black shale subunit and an upper medium- to thick-bedded black chert subunit. The shale is siliceous and carbonaceous and has reported mean concentrations of 74% to 77% SiO_2.

6.3 Property Geology

The Lik deposit is hosted in the upper part of the Ikalukrok Unit of the Kuna Formation. At Lik, the immediate host rocks are carbonaceous and siliceous black shale, with subordinate black chert and fine-grained limestone. These rocks strike broadly north-south and dip at approximately 25° to 40° to the west (Figure 7-3). Figure 7-3 is based on interpretation as there is very little exposure in the deposit area. The massive sulphides are overlain conformably by rocks of the Siksikpuk Formation. The sequence is overridden by allochthonous rocks that form high hills north and west of the deposits.

The mineralized sequence was initially interpreted to be cut by several minor faults. Recent drilling and interpretation demonstrated that some of the inferred faults may not exist, or the movement on the fault is minor. The most significant of these faults is the Main Break Fault (Figure 6-3). While the plunge of the northern end of the Lik deposit increases to approximately 25° to 42°, it is no longer thought that there is a break separating the Lik South and Lik North deposits. It is also unclear whether there is a change in strike north of the fault, or whether the change is more apparent due to topography. Additional drill data will be needed to clarify these relationships.

There is another group of steeper faults that were interpreted to strike northerly or northwesterly with reverse throws of up to 100 m. Interpretation of drilling in 2008 appears to demonstrate that several of these faults may also be non-existent or more minor than previously interpreted.

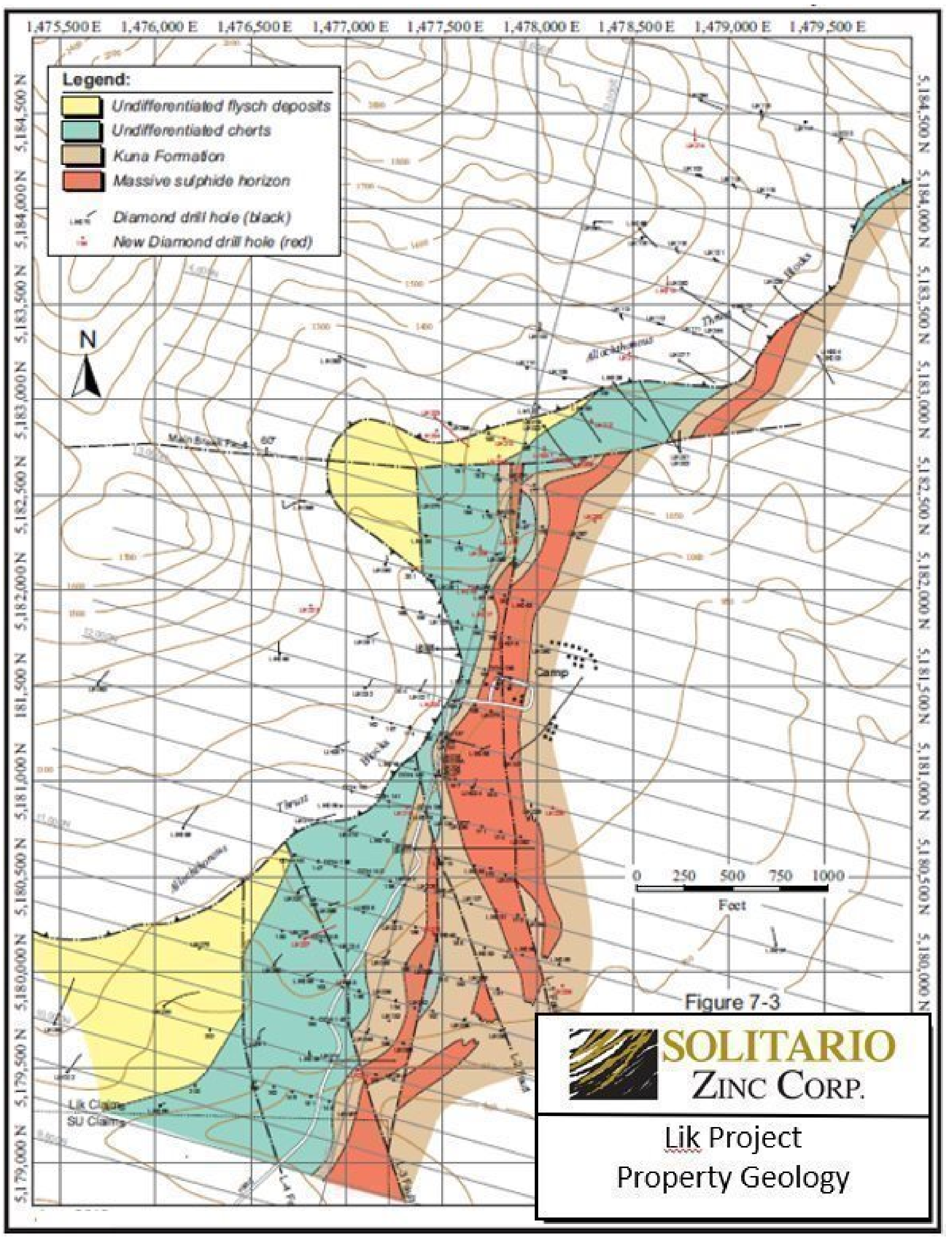

Figure 6-3: Lik Geologic Map

6.4 Mineralization

The Lik deposit is a stratiform zinc-lead-silver deposit. The deposit is continuous outside the Lik property onto the adjacent Su property to the south held by Teck. The southern continuation of the Lik deposit is referred to as the Su deposit.

Within the Lik property, the deposit is divided into two parts. The main part of the deposit within the existing claims is referred to as the Lik South deposit. Previously, the boundary between the Lik South and Lik North deposits was defined by the Main Break Fault. More recent work appears to show that the fault does not exist, or that its displacement is minor. The division into two separate blocks is maintained and the boundary is taken as Section 13800N for this report. As presently interpreted, the largest lens, the A Lens of the Lik South deposit, is approximately 1,100 m long and 600 m wide and much of it is flat-lying. It contains the bulk of the tonnage in the Lik South area. The second largest lens, B Lens, is approximately 500 m long, up to 200 m wide, and averages approximately 120 m wide. The R Lens is approximately 400 m north-south, 100 m east-west, and up to five meters thick and lies about six meters above the A Lens. Mineralization in the Lik South deposits has been tested down dip to a depth of approximately 150 m to 200 m.

The Lik North deposit is approximately 700 m long and 350 m wide. As with the Lik South deposit, mineralization is interpreted as occurring in a number of lenses, with most of the mineralization present in a single lens referred to as the North Lens in this report. The North Lens plunges at about 25° to 42° and has been tested down dip to a depth of about 300 m.

The deposits strike broadly northerly and dip westerly at approximately 25° to 40°. The mineralization comprises stratiform lenses. The mineralogy of the sulphides is simple and is comprised by pyrite, marcasite, sphalerite, and galena, with rare tetrahedrite, bournonite, and boulangerite. Gangue minerals include quartz (as chert), clay minerals, carbonate, and barite. Noranda recognized six different ore types in its logging of drill core (Scherkenbach et al., 1985). Sulphide grain sizes and grades vary between different ore types. Maximum sphalerite grain size is about 100 microns. Figure 7-3 shows the locations of the drill hole collars and the sections included in this report. Typical drill sections for the Lik South and Lik North deposits are shown in Figure 6-4,Figure 6-5, and Figure 6-6.

Typical grades of mineralized intersections within the Lik deposit are listed in Table 6-1.

Previous work by GCO claimed that sulphides were deposited in four distinct cycles. The cycles were believed to have been developed close to the likely hydrothermal source of the mineralizing fluids. Individual cycles were interpreted as being quite thin near the margins of the deposit with the thickest accumulation in a single cycle noted to date is approximately 13.7 m. This interpretation is not considered valid by either Zazu or RPA. The more recent drilling has shown that fine-grained and coarse-grained sulphides are interbedded. Banding is variably developed. Higher grades occur in different levels of the sulphide lenses. Locally, the sulphides appear to be structurally distorted. At least some of the mineralization is cut by debris flows and is considered primary, while other textures apparent in the core appear to indicate that mineralization is at least partly diagenetic or post-diagenetic.

Table 6-1: Typical Mineralized Intersections

Hole No.	From (m)	To (m)	Length (m)	Zn%	Pb%	Ag g/t
5	54.56	78.79	24.23	19.72	6.27	126.5
16	80.16	94.49	14.33	21.67	7.01	230.4
21	129.54	135.33	5.79	7.07	1.88	8.6
24	40.87	50.14	9.27	11.09	1.44	51.1
31	21.49	34.75	13.26	9.07	2.69	6.9
38	45.90	63.76	17.86	8.13	1.80	48.0
38	70.53	87.75	17.22	8.92	2.08	28.8
43	35.66	40.69	5.03	17.66	3.62	8.6
43	60.96	80.28	19.32	9.07	2.49	47.7
43	84.73	91.04	6.31	21.07	5.95	111.4
55	114.0	125.88	11.89	8.15	2.42	205.7
68	32.31	53.43	21.12	13.34	2.85	56.9
79	15.85	31.33	15.48	9.14	2.66	37.0

While brecciated sulphides are common in high-grade areas, they do not form a large percentage of the overall sulphide mass. Individual breccia zones vary in thickness from a few centimetres to a few metres. The origin of the brecciation is not clear, but at least some of it is judged to be primary.

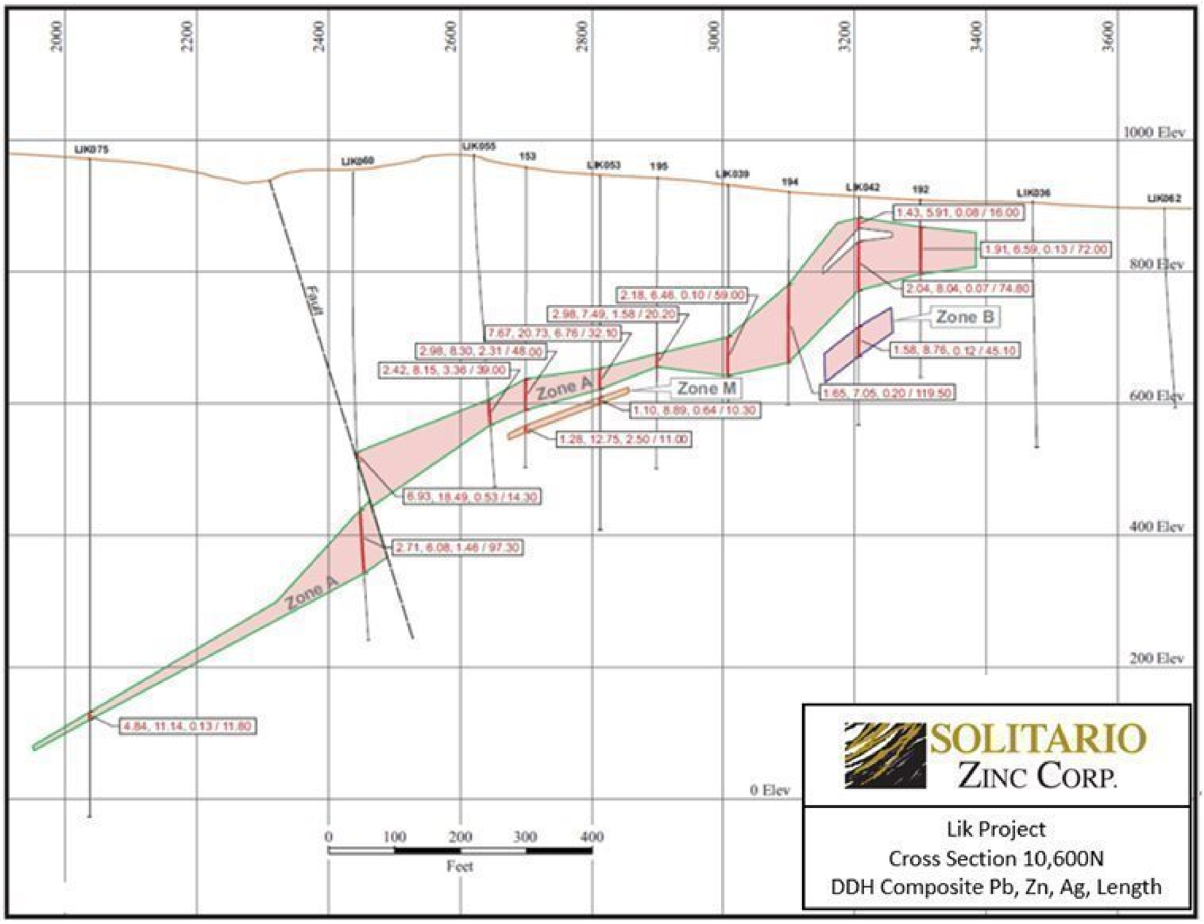

Figure 6-4: Cross Section 10,600N

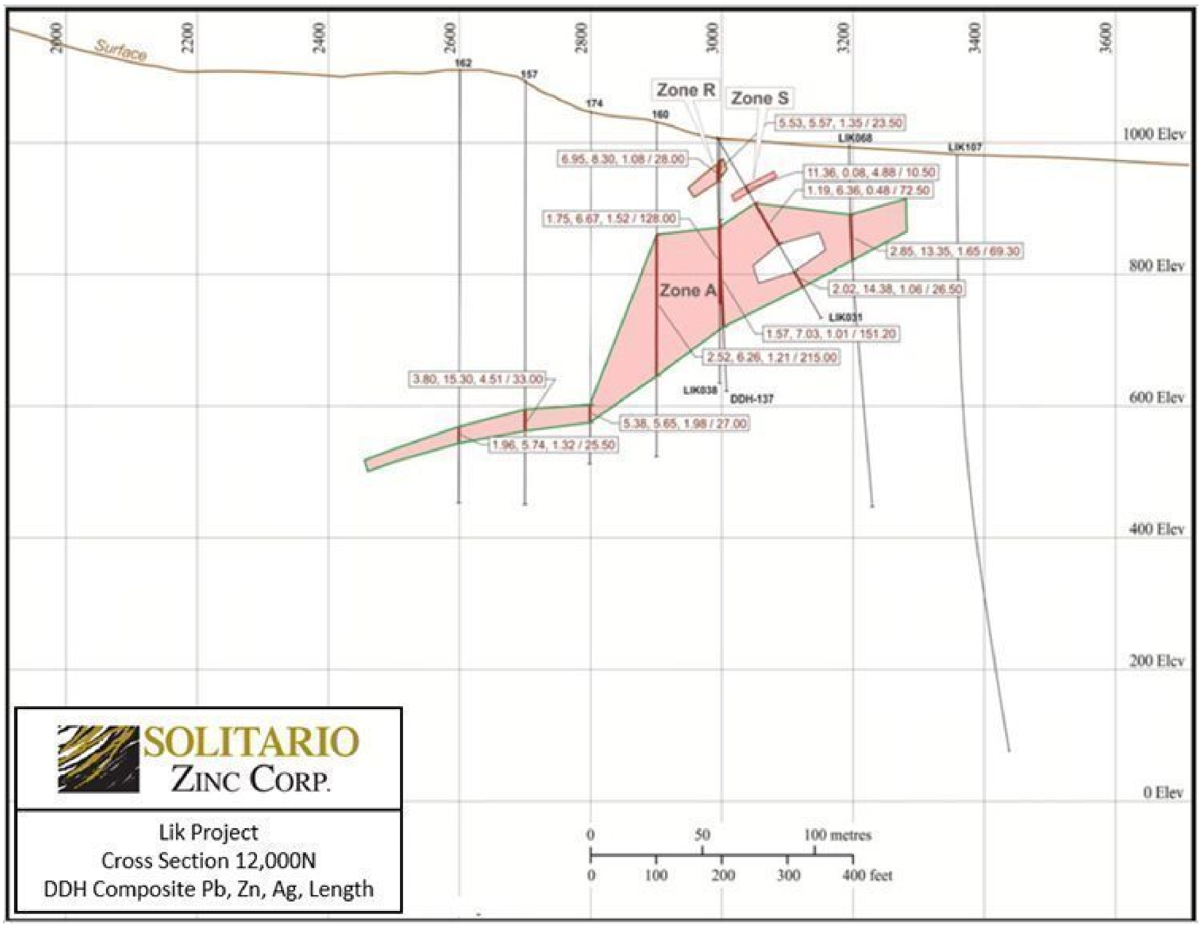

Figure 6-5: Cross Section 12,000N

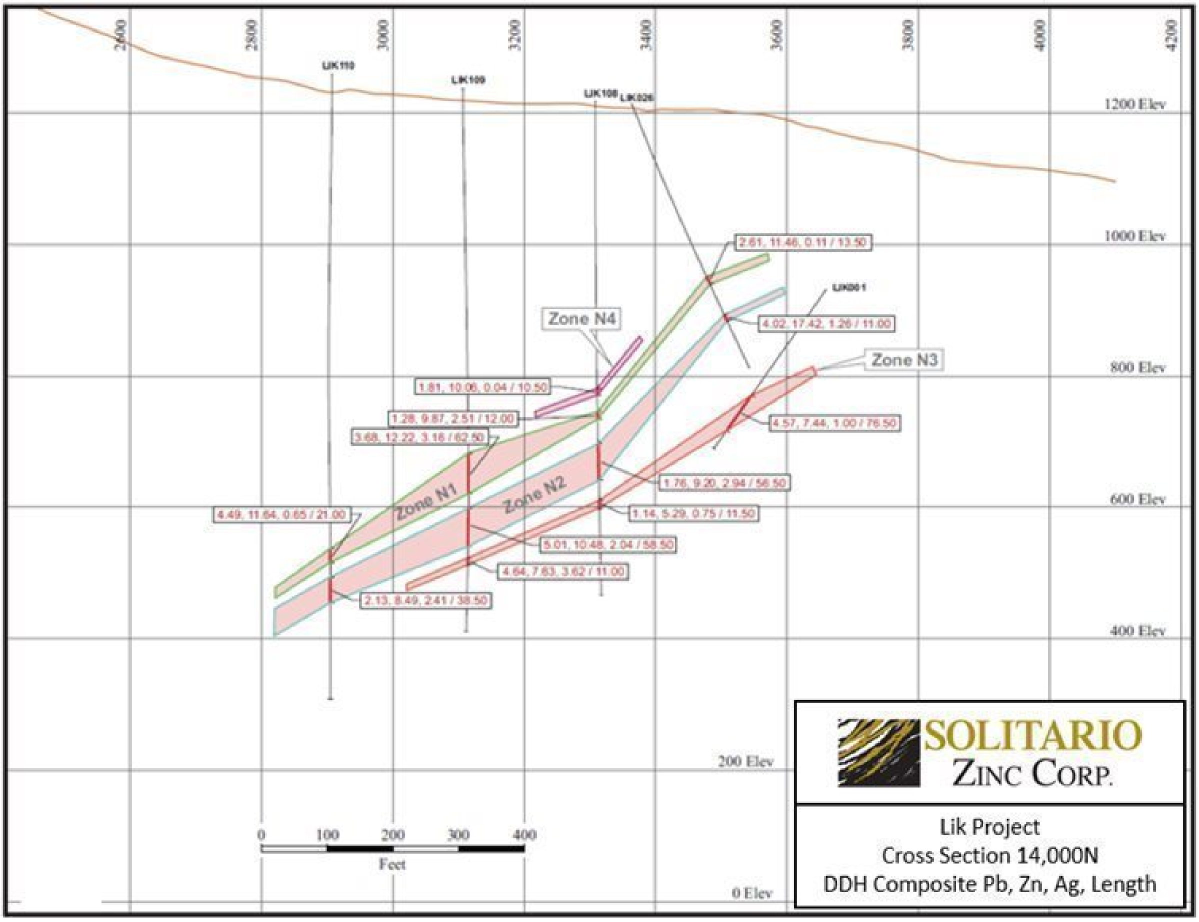

Figure 6-6: Cross Section 14,000N

6.5 Deposit Types

The Lik deposits are examples of a large group of deposits broadly referred to as sediment-hosted zinc-lead-silver deposits. Cox and Singer (1992) described the deposit type thus:

> *Stratiform basinal accumulations of sulphide and sulphate minerals interbedded with euxinic marine sediments form sheet- or lens-like tabular bodies up to a few tens of metres thick and may be distributed through a stratigraphic interval over 1,000 m.*

The model covers a large group of deposits that have been divided into subtypes, including Broken Hill-type, Mount Isa-type, and others. Water depth of deposition of the host units may be variable, the rock types are variable, and the depositional environment may vary from lacustrine to deep water marine.

Historically, the deposits have been regarded as syngenetic, but more recent studies appear to demonstrate that many of the class of sediment hosted deposits are diagenetic. In the case of Red Dog, evidence that the deposits are partially syngenetic and partially diagenetic has been described by Moore et al. (1986).

Typically, metallurgical recovery is affected by post-depositional events. Deposits subjected to higher metamorphic grades typically have higher metallurgical recoveries, however, the post-depositional events may dismember the deposit and lower the quality of the recoverable zinc concentrate.

7 Exploration

7.1 Surveys and Investigations

7.1.1 Exploration by Solitario/Teck

In 2018 the Lik Joint Venture partners (Solitario and Teck) agreed that Teck would conduct field operations as the temporary Joint Venture Operator. This agreement has been renewed on an annual basis through 2022.

During 2018 Geological mapping was undertaken to cover the area in and around the Lik deposit to reassess the interpreted distribution of Red Dog plate stratigraphy which hosts the mineralization at Lik as well as at Teck's Red Dog Mine. The purpose of this work was to gain an understanding of the structural architecture, including fold and thrust style and distribution of the panel-bounding thrusts, to compare styles and geometry of the Lik mineralization to that at Red Dog. Geologic traverses were primarily in and around the Lik camp and to the north, focusing on creek drainages due to good exposure, covering a total of 5 km^2.

A gravity survey was completed over the Lik deposit and to the north to measure gravity response and better understand if high density rock characteristic of massive sulfides might be present in the area apart from the Lik orebody itself.

During 2019 geological re-logging of 20 historical holes (2,568 m) was completed with 2,068.5 m analyzed by Boart Longyear's TruScan XRF. Historical holes were converted to the current Red Dog logging format with efforts to align formation designations, categorize mineralization styles, and develop a new structural model/interpretation.

Efforts were made to complete geologic mapping of the Kelly River/IP Creek thrust contact and trace out prospective Ikalukrok stratigraphy which is present in the Red Dog orebody. A total of 6.4 km^2 was mapped and 45 rock samples were collected to investigate metal anomalies and discriminate between rock units geochemically.

The gravity geophysical program started in 2019 was expanded, largely to the north with 127 gravity stations.

Planned 2022 work includes further expansion of the gravity work to cover the entire property and drilling of three holes to test for lateral expansion and stacked mineralized lenses.

7.1.2 Prior Investigations

Controlled- and Natural-Source Audio-frequency Magnetotelluric (CSAMT and NSAMT) surveys were completed by Zonge Engineering & Research Organization, Inc. (Zonge Engineering) in June and July 2008. Tensor CSAMT and NSAMT data were acquired at 61 m (200 ft) station intervals over six lines for a total of about 8 km (26,400 ft). The primary objective of the survey was to trace mineralization and geological structure from the known drill-tested areas north into undrilled terrain north of the existing Lik North deposit. To achieve this objective, two orthogonal transmitter bipoles were located 5 km south-southeast of the survey area so that nearly orthogonal source-field orientations were generated over the survey area.

While a number of trends were recognized (Scott et al., 2010), the surveys do not appear to have identified continuations of mineralization.

In 2010, Teck completed a Helicopter-borne Time Domain Electromagnetic (HTEM) geophysical survey of that part of the Brooks Range area that included the Lik property. The raw results of the survey within the Lik property were given to Zazu by Teck. These data were processed but the information was considered not to show any noticeable relationship to the drill-tested mineralization and no final interpretation was obtained by Zazu. The HTEM data are considered to contribute very little to the ongoing exploration effort.

7.2 Drilling Exploration

7.2.1 Summary

The drilling to date on the Lik Project is summarized in Table 7-1. The most recent drilling programs were conducted by the former operator of the project, Zazu Mineral Corp. between 2007 and 2011. These programs were drilled using company owned drill rigs and contract drilling crews.

Table 7-1 Historic Exploration Drilling

Year	Number of Holes	Aggregate Depth (m)	Company
1977	10	1,603	Managed by WGM
1978	79	10,680	Managed by WGM
1979	14	4,931	Managed by GCO
1980	3	202	Managed by GCO
1983	1	835	Managed by GCO
1984	6	1,643	Managed by GCO
1985	16	4,883	Managed by Noranda
1987	1	697	Managed by GCO
1990	3	263	Managed by Moneta
1992	2	284	Managed by GCO
2007	11	1,394	Managed by Zazu
2008	57	6,830	Managed by Zazu
2011	24	3,811	Managed by Zazu
Total	**229**	**38,201**	

7.2.2 2011 – 2007 Zazu Minerals Corp. Drilling

Three drilling campaigns, identified by year 2007, 2008, and 2011, were drilled by Zazu Minerals Corp. Diamond drilling was carried out using a drill rig owned by Zazu but manned under contract. The drill moves were facilitated by helicopter. The purpose of the 2007 and 2008 drilling was to confirm and expand the Lik South deposit area and to obtain samples for metallurgical test work. The 2011 drill program targeted both the Lik North and Lik South deposit areas and obtained samples for metallurgical and geotechnical purposes.

Holes in all three campaigns were drilled at HQ size and hole recoveries were very good, approaching 100% recovery in 2011. Downhole and collar surveys were conducted for each hole. All core was logged on site, the core was split using diamond saw and half of the core was sent for assay. Because Marcasite, a mineral that oxidizes rapidly is present, air was removed and replaced with nitrogen for the core send for assay.

7.2.3 Drilling by GCO (1879 – 1984, 1987, 1992)

GCO completed several rounds of drilling programs but reports do not list the drilling contractor. Sources indicate that NQ sized core was drilled which was reduced in size as needed. Reports mention that recovery was typically high. The objectives of these programs were to complete the in-fill drilling in the south and test the limit of the deposit down dip.

7.2.4 Drilling by WGM (1977 – 1978)

WGM carried out the initial diamond drilling campaigns on the Lik property using an unnamed drilling contractor. Holes were collared as NQ size, however several holes required reduction to BQ size due to ground conditions. Core recovery information is not available. Accounts indicate that much of the core is still located on site at Lik. By the end of this drilling program the general shape of the deposit was defined, and the overall grade of the deposit determined.

7.3 Hydrogeology

The authors are not aware of any hydrogeology studies completed for the Lik Project.

7.4 Geotechnical Data, Testing and Analysis

EBA Engineering Consultants Ltd performed a geotechnical analysis which is documented in the report "Geotechnical Site Investigation & Geotechnical Pre-Feasibility Study for Proposed Open Pit at the Lik Deposit" dated December 2011.

7.5 QP Statement

There are no know drilling factors that could materially impact the accuracy and reliability of the sampling results.

7.6 Drill Hole and Sample Location Map

Figure 7-1 shows the drill hole location map for the Lik Project.

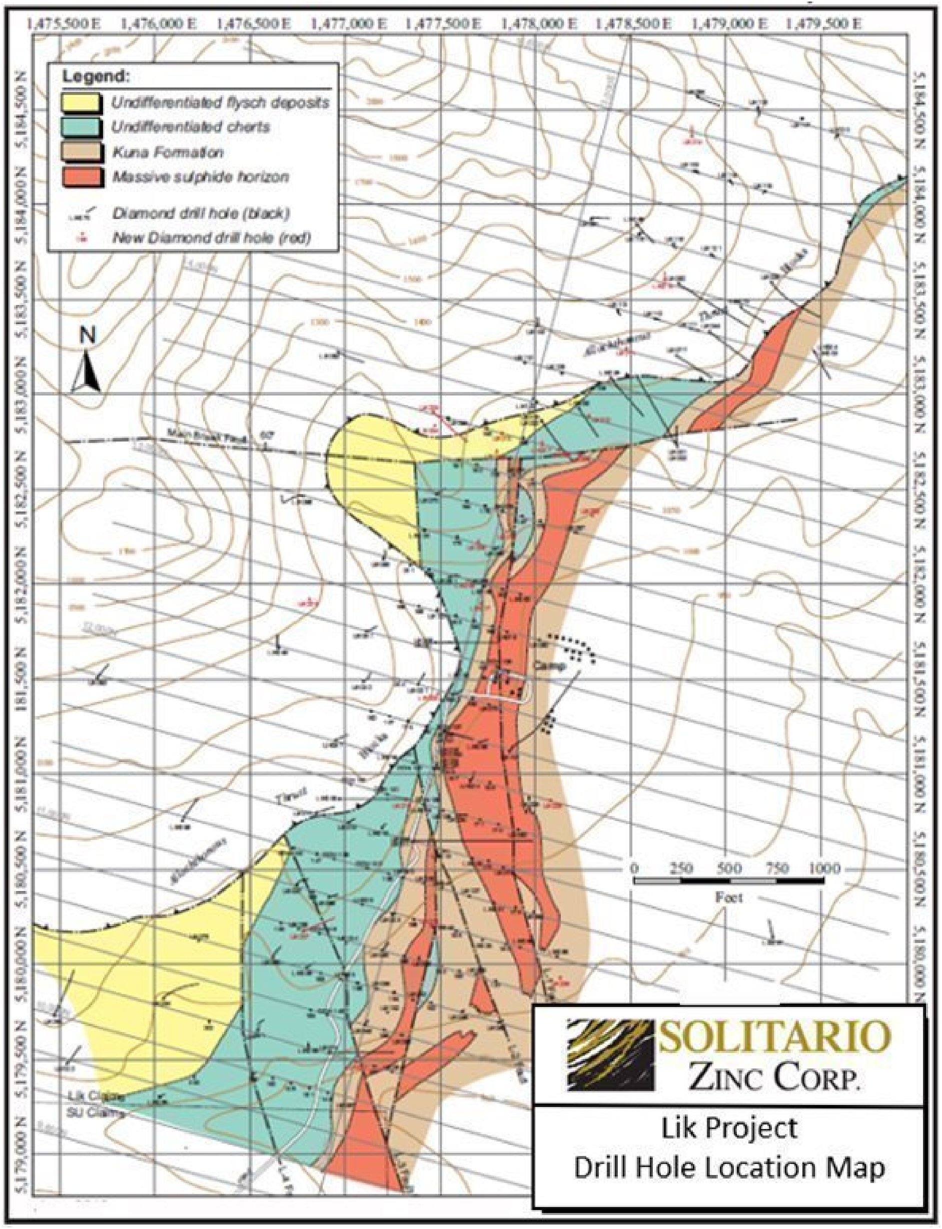

Figure 7-1: Lik Drill hole Location Map

8 Sample Preparation, Analysis and Security

8.1 2011 – 2008 Exploration Program

Samples from the 2008 and 2011 summer drilling campaigns were sent to the preparation facilities of ALS Chemex located in Fairbanks, Alaska. At Fairbanks, the samples were treated using Sample Preparation Package – PREP-31. This is a standard sample preparation protocol. The following steps were followed for the Zazu samples:

- LOG-22 – Each sample was logged into the tracking system and a bar code was attached to the sample. Each sample was weighed and dried.
- CRU-31 – Each sample was finely crushed so that more than 70% of each sample was passing 2 mm.
- SPL-21 – Samples were split using a riffle splitter.
- PUL-31 – A 250 g sample was split out and pulverized so that greater than 85% of each sample was passing 75 microns.

The pulps were analyzed at ALS Chemex in Fairbanks with over-limit samples transferred to an ALS Chemex facility located in North Vancouver, British Columbia. The ALS Chemex facility in North Vancouver has received ISO 17025 accreditation from the Standards Council of Canada under CAN-P-4E (ISO/IEC 17025:2005), the General Requirements for the Competence of Testing and Calibration Laboratories, and the PALCAN Handbook (CAN-P-1570).

The basic analyses for each sample, ME-OG62, included:

- SY-4A01 – four acid digestion. A 0.4 g sample of the pulp was digested in 100 mL of nitric, perchloric, hydrofluoric, and hydrochloric acids for 180 minutes at 220ºC and then evaporated to incipient dryness. Hydrochloric acid and de-ionized water were added for further digestion and the sample was heated. The sample was cooled to room temperature and transferred to a 100 mL volumetric flask.
- ICP-AES - The resulting solution was diluted to volume with de-ionized water, homogenized, and the solution was analyzed by inductively coupled plasma-atomic emission spectrometry (ICP-AES).

This protocol has an upper limit of 1,500 ppm Ag, 20% Pb, and 30% Zn and a lower limit of 1 ppm Ag, 0.01% Pb, and 0.01% Zn.

In cases where lead values exceeded the upper limits of the analytical procedure, volumetric titration with EDTA (Ethylene Diamine Tetraacetic Acid) was used. This methodology has an upper limit of 100% Pb. An examination of the assay datafile for the original Lik samples shows that two of the original lead samples assayed greater than 20% Pb and were re-assayed by volumetric titration. In cases where the zinc values exceeded the upper limits of the ICP-AES methodology, volumetric titration with EDTA and using Xylenol orange as an indicator was used. In both cases, a 0.4 g to 1.0 g prepared sample was digested using a four acid digestion.

In 2011, Zazu dispatched the original drill samples sent for analysis together with a further 30 blank samples, 32 reference samples, and 19 core duplicate samples. An assessment of the QA/QC results indicates that:

- Blank samples gave low results, indicating that intersample contamination was not a problem in 2011.
- Core duplicate samples gave acceptable reproducibility.
- Zazu inserted eight different reference samples during the 2011 drilling season sourced from CDN Resource Laboratories Ltd. of Vancouver. Generally, the reference samples gave acceptable results, although several of the low lead values exceeded the three standard deviation level and are considered to have failed. RPA considered that the minor problems experienced do not invalidate the mineral resource model developed.

RPA was of the opinion that the sample preparation, security, and analytical procedures completed was carried out to industry standards.

The Lik camp is an isolated fly-in facility. On-site security is not considered to be a major problem. Samples were transferred by company personnel to Kotzebue and transported to the laboratory by bonded carrier. No significant security risks was apparent to RPA.

8.2 2007 Exploration Program

The 2007 Lik samples were dispatched to G&T, an ISO 9001:2000 certified laboratory for precious metals and base metals. As well as completing the analyses for a range of elements, G&T also carried out a program of metallurgical testing. Zazu transferred pulps from G&T to ALS Chemex in Vancouver for check analysis as part of the Quality Assurance/Quality Control (QA/QC). Reproducibility between G&T and ALS Chemex was found to be good. Zazu was not responsible for any part of the sample preparation or analysis.

G&T prepared the Zazu samples using its SMS21 Preparation Method. The major steps in this protocol were:

- Samples were received, identified, and labelled.
- Samples were passed through a jaw crusher to reduce the core to >10 mesh.
- Samples were passed through a cone crusher until +99% of the sample was 10 mesh.
- Samples were riffled to cut a sample of about 500 g.
- This material was treated in a ring pulverizer so that all of the material was <100 microns.
- A pulp of 250 g was sent for analysis.

The material was then treated using the AMS08 protocol for analysis. Major steps included:

- Samples were dissolved using an aqua regia digestion.
- The samples were analyzed using inductively coupled plasma (ICP) analysis.

Other QA/QC procedures employed by Zazu included the use of blanks (unmineralized core from outside of the mineralized zone) and quartered duplicates. Zazu was unable to obtain acceptable reference samples for the 2007 field season and reference samples were not included as part of the 2007 ongoing QA/QC program.

8.3 GCO Exploration Program (1979-1984, 1987, 1992)

Core was logged on site and sampling completed using diamond saws. All samples were sent to Bondar-Clegg in Vancouver, BC for analysis, however assay protocols were not available. There are no reports available detailing Quality Assurance and Quality Control (QA/QC) procedures.

8.4 WGM Exploration Program (1977 -1978)

Core from this program was split using diamond saws and sample sizes varied from 0.30 m to 6.1 m, with an average sample length of 1.39m (Frederickson et al, 1979). Samples were bagged and sent to Bondar-Clegg in Fairbanks, AK. Samples were analyzed for lead, zinc and silver, but the method was not disclosed. No information is available on QA/QC procedures

8.5 Opinion of Adequacy

The QP has reviewed the drillhole sample database and RPA's work evaluating its adequacy and considers the sample preparation and analysis procedures to comply with industry best practice. The QA/QC methods and results adequately verify the analytical database as sufficient for use in resource estimation.

Field exploration methods were reviewed by the QP and found to be appropriate for characterization of geology, geochemistry and geophysical evaluation in similar programs, and identifying future drill targets.

9 Data Verification

The authors of this report have relied solely upon the digital datasets supplied by Solitario. Drillhole locations were confirmed in cartesian space against existing drillhole and geology maps, and cross-sections generated by RPA. Drillholes appear properly located and conform to topography. Furthermore, drillhole samples and logged intervals align with the modeled mineralized domains and block model in 3-dimensional space.

9.1 General

The authors of this report have not completed site visits due to health risks and travel restrictions in place during the current COVID pandemic. The authors of this report are relying upon the verification work done by the authors of the 2014 PEA and the 2012 Technical Report and upon discussions with Solitario personnel. RPA completed several site visits, data verification studies, and previous NI 43-101 reports on the Lik property, which have been audited. The results of the previous data verification work are summarized below.

9.2 2007

As noted above, Zazu maintained an industry standard QA/QC program during its drilling campaigns of 2007 and 2008.

RPA completed check sampling of diamond drill core from the 2007 as part of a verification process for samples from the drill campaign during a property visit in September 2007. Eight samples of quartered core were collected and the samples were returned to Toronto in the custody of the RPA representative. Details of the samples collected are set out in Table 12-1.

Table 9-1:RPA Check Samples 2007

Hole ID	Sample ID	From (m)	To (m)	Length (m)
DDH 139	462151	26.52	28.04	1.52
DDH 143	462152	75.29	76.81	1.52
DDH 143	462153	81.39	82.91	1.52
DDH 143	462154	58.96	87.48	1.52
DDH 143	462155	90.53	92.05	1.52
DDH 143	462156	101.19	102.71	1.52
DDH 136	462157	99.67	100.89	1.52
DDH 136	462158	100.89	102.41	1.52

The check samples were dispatched to the SGS Canada laboratory in Toronto for analysis. The results of the analyses by SGS Canada and G&T are tabulated in Table 12-2.

Table 9-2:2007 Check Sample Comparison

RPA Sample ID	SGS Results		G&T Sample Results	
	Zn%	Pb%	Zn%	Pb%
462151	0.05	0.07	0.92	0.76
462152	0.2	0.04	0.55	0.22
462153	7.98	10	21.5	14.2
462154	5.89	9.07	1.65	8.96
462155	9.13	1.06	10.7	1.68
462156	3.55	0.63	4.52	0.86
462157	1.09	0.6	1.02	0.51
462158	3.09	1.26	3.9	0.82

One of the samples shows significant variation between the SGS value and the G&T value. Further assaying will be required to determine whether there is a problem with this data.

Diamond drill collar positions and core storage buildings were inspected during the RPA visit.

One of the objectives of the 2007 drilling was to twin several of the previous holes with the purpose of confirming the earlier work. Three of the holes completed were twin holes of earlier drilling. Of the holes drilled, DDH 137 twinned DDH 38, DDH 138 twinned DDH 76, and DDH 139 twinned DDH 15.

Results of these twin holes are shown in Table 12-3.

Table 9-3:Results of Twin Holes

Hole ID	From (m)	To (m)	Length (m)	Pb%	Zn%
DDH 137	4.88	16.92	12.04	3.38	7.72
	34.14	76.5	42.36	1.67	6.49
DDH 38	11.89	17.37	5.48	7.61	6.52
	45.9	87.75	41.85	1.72	7.42
DDH 138	7.01	32.61	25.6	2.44	8.2
DDH 76	10.36	33.99	23.63	1.48	9.49
DDH 139	29.56	46.02	16.46	2.13	8.95
DDH 15	31.09	48.16	17.07	2.69	10.44

Overall, these twinned holes appear to show reasonable correlation. The higher intersections in holes DDH 137 and DDH 38 are markedly different because of core loss in the upper part of DDH 38. The depth differences between DDH 137 and DDH 38 for the lower intersection may reflect hole deviation. When individual assays are examined, there is correlation between the higher grade areas in the various twinned holes.

9.3 2008

Further verification sampling was completed during the 2008 field visit. A further eight samples of quartered core were collected, with the samples coming from two different holes. The samples were selected to cover a number of different grades. The verification samples were dispatched to SGS Laboratories in Toronto. Samples for base metals were assayed using the ICP90Q protocol (sodium peroxide fusion with ICP-AES analysis), while silver was assayed using FAG323. The locations of the verification sampling are tabulated in Table 12-4 and the results are tabulated in Table 12-5.

Table 9-4: RPA Check Sample, 2008

Hole ID	Sample ID	From (m)	To (m)	Length (m)
179	553393	74.07	75.59	1.52
179	553394	78.64	80.16	1.52
179	553395	80.16	81.69	1.53
179	553396	86.26	87.78	1.52
182	553397	64.47	64.92	0.45
182	553398	64.92	66.45	1.53
182	553399	86.72	87.78	1.06
182	553400	89.31	90.83	1.52

Table 9-5: 2008 Check Sample Comparison

RPA Sample ID	SGS Results			G&T Sample Results		
	Zn%	Pb%	Ag ppm	Zn%	Pb%	Ag ppm
553393	13.2	6.26	<3	11.3	4.82	3
553394	8.14	1.16	<3	7.11	1.02	2
553395	9.38	3.8	<3	8.69	2.96	<1
553396	9.49	0.93	60	10.5	0.62	46
553397	6.94	4.64	114	6.4	4.01	110
553398	7.3	3.1	60	7.14	2.26	103
553399	11.6	2.7	138	11	2.92	153
553400	25.3	9.1	400	23.6	8.37	427

The verification sampling completed by RPA shows a slight bias for base metals (zinc is 7% higher overall, lead is 17% higher overall) in the SGS samples and a slight bias towards silver (9%) in the ALS samples.

9.4 2011

RPA completed check sampling of diamond drill core from the 2011 as part of a verification process for samples from the drill campaign during a property visit in September 2011. Nine samples of quartered core were collected and the samples were sent to ALS Chemex in Fairbanks. Details of the samples collected are set out in Table 12-6.

Hole ID	Sample ID	From (m)	To (m)	Length (m)
DDH 139	462151	26.52	28.04	1.52
DDH 143	462152	75.29	76.81	1.52
DDH 143	462153	81.39	82.91	1.52
DDH 143	462154	58.96	87.48	1.52
DDH 143	462155	90.53	92.05	1.52
DDH 143	462156	101.19	102.71	1.52
DDH 136	462157	99.67	100.89	1.52
DDH 136	462158	100.89	102.41	1.52

The locations of a number of the 2011 drill hole collars were visited in the field. The drill hole collar sites are well marked.

Table 9-6:2011 Check Sample Comparison

RPA Sample ID	Check Results			Initial Results		
	Zn%	Pb%	Ag ppm	Zn%	Pb%	Ag ppm
3801	9.51	2.06	1	8.84	2.08	1
3802	6.55	1.81	98	4.79	4.07	53
3803	10.05	2.18	30	13.9	0.8	52
3804	13.15	1.78	52	10.8	0.93	47
3805	9.34	2.38	32	10.35	1.99	27
3806	6.3	1.16	35	8.75	2.93	54
3807	16.75	4	106	19.45	3.87	115
3808	15.15	5.77	119	15.85	5.77	130
3809	0.17	0.2	6	0.33	0.12	2

There is reasonable correlation between these two sets of analyses, which should be considered as core duplicates.

Documented in the 2014 PEA, RPA is of the opinion that the data is adequate for the preparation of an updated Mineral Resource estimate.

9.5 Data Verification Statement

The authors of this report believe that the data verification performed on the drill data used in the 2014 PEA are sufficient for the purposes of this report. The authors acknowledge that the data verification in this report is reliant on previous qualified persons documentation and opinion and that data verification for this report is limited to the review of the above data. Further infill drilling can support confirmation of the database and improvement in the mineral resource classification.

10 Mineral Processing and Metallurgical Testing

The following section was assembled by RPA for the 2012 Technical Report.

10.1 General

As discussed under Section 10 Drilling, further metallurgical samples were collected by diamond drilling during the 2011 summer season. The work was supervised by Mr. George Rawsthorne, of JDS Energy and Mining, Inc. The drill samples collected for metallurgical testing were treated in a similar fashion to those collected in 2008. The samples were placed in plastic bags and the bags purged with nitrogen. This treatment was carried out to prevent oxidation prior to sample testing.

Metallurgical test work was being undertaken by G&T in Kamloops, British Columbia. G&T was involved in previous testing.

The section on metallurgical testing that formed part of Scott et al., 2010 is included below.

10.2 G&T Flotation Program 2013

The G&T flotation test work program utilized exploration holes drilled in the 2010 drilling program. Three composites were generated representing roughly three equal periods in a theoretical mine schedule (period 1, period 2 and period 3).

The test program consisted of four cycle tests the results of which are shown in Table 10-1.

Table 10-1 G&T Flotation Results, Period Composites

Test	Element	Feed	Pre float Conc.		Lead Concentrate		Zinc Concentrate	
		Grade	Grade	Recovery	Grade	Recovery	Grade	Recovery
Test 13, Period 1	Pb %	3.16			52.3	76.3	1.82	8.7
	Zn %	10.9			9.17	3.9	59.6	82.6
	Ag g/t	72			197	12.5	141	29.3
Test 18, Period 1	Pb %	3.04	2.44	4.2	54.7	75.9	1.72	10.1
	Zn %	10.7	10.2	4.9	5.3	2.1	52.8	88.1
	Ag g/t	73	60	4.3	204	11.9	132	32.4
Test 25 Period 2	Pb %	2.89	2.35	7.4	53.1	61.4	2.28	10.2
	Zn %	9.28	9.95	9.7	4.47	1.6	51.4	71.7
	Ag g/t	25	23	8.3	44	5.8	42	21.6
Test 24 Period 3	Pb %	1.84	1.68	5.9	76.6	59.5	1.98	10.8
	Zn %	7.07	7.60	7.0	1.84	0.4	56.4	80.5
	Ag g/t	28	28	6.4	80	4.2	52	18.8

10.3 G&T Comminution Testwork 2013

G&T completed a series of comminution tests on seven separate composites classifying the composites by time period and mineralization type. However, a typo exists in the results table, a categorization based on the mineral type cannot be determined based on table labeling. A summary of results are available in Table 10-2.

Table 10-2 G&T Comminution Testwork 2013 Results

Sample ID	Description	Bond Ball Wi (kWh/ton)	Bond Rod Wi (kWh/ton)	Crushing Wi (kWh/ton)	Abrasion Index (lbs/kWh)	SMC (A x b)	PLI-UCS (MPa)
1	Semi Massive Sulf, Yr. 1-2	14.8	13.6	9.3	0.10	48.0	110
2	Semi Massive Sulf. Yr.3-5	14.8	14.5	6.0	0.23	54.3	82
3	Semi Massive Sulf. Yr. 6-8	12.7	12.3	6.1	0.12	75.9	81
4	Semi Massive Sulf, Yr. 1-2	11.6	12.7	7.6	0.16	66.3	84
5	Semi Massive Sulf. Yr.3-5	12.2	13.6	8.4	0.16	46.7	113
6	Semi Massive Sulf. Yr. 6-8	13.7	13.5	12.7	0.17	46.0	102
7	Semi Massive Sulf, Yr. 1-2	12.6	12.3	6.2	0.17	67.3	61

Commentary regarding Table 10-2 testwork follows below:

- The bond ball mill work index range is considered to be low to medium hard ore.
- The bond rod mill work index range is considered to be low to medium hard ore.
- The bond crushing work index indicates low to medium hard ore for crusher operations.
- The bond abrasion index indicates that the material is moderately abrasive.
- The SMC tests (SAG Mill Comminution) indicates that the material tested is moderately resistant to breakage in a SAG mill.

10.4 SGS 2010 Program

The master composite used in the G&T Program (2008) was moved to SGS Labs in Vancouver with the goal of confirming the G&T Program and addressing the high levels of silicate in the zinc concentrate identified in the previous program.

10.5 G&T Program (2008)

Approximately 2,000 kg of samples from 13 drill holes during the 2007 drilling campaign were composited into one master composite for preliminary investigations at G&T Laboratories in Kamloops. This 318 kg master composite would be used for the 2008 test work and subsequent test work through 2011. Sample analyses were done in late 2007, while metallurgical test work was conducted mainly in Q1 2008, with the results reported by G&T on May 15, 2008.

The master composite sample was selected to provide a reasonable cross-sectional representation of the deposit and target a mill head grade expected to be close to the life of mine head grade. At the time of the program, RPA believed the master composite sample is reasonably representative of the expected production grades.

G&T completed metallurgical testing on a single composite comprised of drill core samples obtained from the 2007 drilling campaign under the supervision of Kevin Scott, P.Eng., RPA Principal Metallurgist. Approximately 2,000 kg of individual samples from eight drill holes were provided by Zazu for use in this study, from which a 318 kg master composite was constructed for use in testing.

A summary of the flotation test work results is shown in Table 10-3. Mineralogical work identified pyrite as the dominant sulfide mineral. From a flotation perspective, the mass ratio of galena to sphalerite is relatively favorable at about 1:4. A small percentage of the lead is suspected of being in non-sulphide forms and relatively non-separable by typical flotation schemes.

- Contaminants in lead concentrate, in order of relative abundance, were non-sulfide gangue, sphalerite, and pyrite, with two-thirds unliberated.
- The primary contaminant in zinc concentrate was non-sulfide gangue accounting for 15% of the concentrate mass, with about two-thirds interlocked with sphalerite.
- Galena losses to the tailings streams totaled 19%, with about half lost as liberated grains.
- Sphalerite losses to the tailing streams totaled 12% and practically all occurred as unliberated particles locked with pyrite or non-sulfide gangue.

Concentrate analysis showed the silica level in the zinc concentrate was 10.1%, which is well above typical smelter penalty levels. This level of silicate would make the zinc concentrate difficult to market and subject to penalties. The mercury and fluorine levels in the zinc concentrate, at 118 ppm and 242 ppm respectively, are also considered relatively high. Noted in the report was the presence of carbonaceous material which could be impacting floatation performance.

Table 10-3 Summary G&T 2008 Test Work

Test	Element	Feed	Lead Conc.		Zinc Conc.	
		Grade	Grade	Recovery	Grade	Recovery
Test 21	Pb %	2.36	70.3	70.3	1.57	9.4
	Zn %	8.47	.40	1.2	52.2	87
	Ag g/t	34	68	4.8	64	27
Test 22	Pb %	2.60	76.7	59.5	3.99	23.9
	Zn %	8.78	2.53	0.6	45.1	80.0
	Ag g/t	33	64	3.9	55	26.0

10.6 Mineralogy

QSCAM analysis, to assess mineralogy was performed on the master composite sample and the period samples. The following items are a summary of the findings for the master composite sample analyzed as part of the SGS Test work Program 2009:

- The master composite sample was estimated to contain 43% pyrite, 31% quartz, 15% sphalerite and 3% galena.
- Lead mineralization was predominantly galena. However, the 15% to 19% of the contained lead reported to be in non-sulfide forms and would not be expected to respond well to conventional flotation. At a K80 sizing of 76um, galena liberation was estimated to be about 60%.
- Zinc mineralization was predominantly sphalerite. A small amount 3% of the zinc present was contained in oxide and carbonate minerals. Sphalerite liberation at a K80 of 76um is poor, at an estimated 33%. The unliberated sphalerite was equally distributed between binaries with gangue and as structurally complex multiphase particles
- Pyrite present manly in the eudhedral form was the dominant sulfide mineral at 43%
- Silver was present at 35 g/t

The following items are a summary of the QSCAM analysis done on the period composites.

- Lead mineralization was predominantly galena, and at a K80 sizing of 36 um the galena is considered will liberated at 65%, 72% and 75% for the three period samples. The unliberated galena was locked in multiphase structures with some interlocking with other sulfide minerals
- Zinc mineralization was predominantly sphalerite. A small amount of zinc iron oxide was detected in some of the samples. Sphalerite liberation for a K80 sizing at 36 um is considered well liberated at 61%, 60% and 63% for the three period samples. Unliberated sphalerite was locked in binary non-sulfide gangue or in multiphase structures.
- Pyrite was the dominant sulfide mineral in all composites ranging in content from 36% to 39%.
- Silver was present in the samples between 26 – 75 g/t

10.7 Data Adequacy

The author of this section believes that the current level of metallurgical testwork done on the Lik project provides sufficient support for the project at its current level of development. The analysis documented indicates that there is a reasonable prospect of economic extraction. It is possible that further testwork may yield higher recoveries of lead and zinc with the introduction of finer grinds.

11 Mineral Resource Estimate

The mineral resource statement included in this TRS is based on a resource model developed by RPA and documented in the 2014 PEA. Since the effective date of the 2014 PEA, the authors are aware of no new exploration, data, or changes to the database supporting the existing resource estimate. The estimated mineral resources have been audited by Mark Shutty for this current TRS using Leapfrog Geo/Edge 2021.2.3 software in February 2022.

11.1 General Statement

Mineral Resources for the Lik Project were estimated within a block model encompassing the modeled mineralized zones. Table 11-1 summarizes the mineral Resources of the Lik Project based on the effective date of this report, January 1, 2022. Resources are presented at a cutoff grade of 5% Zn + Pb and within a pit optimization shell in Table 11-1.

For the current resource estimate only surface mining methods are considered. While there may be potential to exploit mineralization via underground mining methods, this was not considered in the current resource statement.

Table 11-1 Mineral Resource Estimate

Location	Indicated Resources				Inferred Resources			
	Mt	% Zn	% Pb	g/t Ag	Mt	% Zn	% Pb	g/t Ag
Lik South	17.1	8.04	2.69	50.0	0.71	7.78	1.97	14.3
Lik North	0.51	8.95	2.46	52.9	2.09	8.93	2.98	47.2
Total	17.6	8.07	2.68	50.1	2.80	8.64	2.73	38.9

The preliminary pit optimization was prepared using Datamine Software. The drillhole database, mineralized domain solids and block model were imported into Leapfrog Geo/Edge 2021.2.3 for review.

11.2 Database

The database for the current resource estimate consists of 223 diamond drill holes totaling 37,833 m. This drill hole database excludes historic holes that have collar and survey data but no assay data. Details of the drilling campaigns are provided in Section 7.

Solitario supplied data used by RPA to WSP, consisting of drillhole tables in MS Excel spreadsheet formats that included collar, survey, and assay files. Validation revealed no errors in the database. Previous work on the Lik property used the NAD 27 coordinate system, but current work has been done using NAD83

The primary sources of density information on the Lik deposit are the 1985 Scherkenbach et al. report and the 2008 G&T report. Scherkenbach et al. (1985) included 62 density determinations from three diamond drill holes. All these samples were analyzed for zinc, lead, silver, barium, copper, and mercury. Scherkenbach et al. (1985) relied on density values for samples with Zn+Pb greater than 5%. Some 35 density values for samples for which Zn+Pb were greater than 3% were also available. The 2008 G&T metallurgical report included some 300 density determinations. Of these, 144 were for samples for which Zn+Pb were greater than 3%. The average of these values was close to 3.5 g/cm^3 (0.109 tons/ft^3) and this value was used in the RPA estimate to convert volume into tonnes. Density is primarily affected by the amounts of pyrite and silica in each sample. Iron values are available for the G&T work but not for the earlier work. The correlation between zinc and iron values is poor.

11.3 Geological Interpretation and 3D Solids

All of the drilling by Zazu in 2007 and 2008 targeted the Lik South deposit. RPA digitally plotted the drill holes for the Lik deposits on drill sections at 200 ft (61 m) intervals corresponding to the spacing of most of the drill sections in the field. Both grid east-west and grid north-south sections were plotted. Zazu provided an interpretation of the deposit based on previous work completed on the deposit. RPA reviewed the previous interpretation and made adjustments for the new drilling completed in the summer of 2011. The results of the 2011 drilling have not significantly changed the interpretations of the various lenses. The most important changes are that the Lik South deposit has been extended to the northeast, while drilling in Lik North confirmed the existing interpretation and extended the mineralization to depth.

Base metal mineralization at Lik appears to occur in a number of lenses. The bulk of the Lik South mineralization is interpreted as being in two lenses, with the A Lens being the larger, while the bulk of the Lik North mineralization is interpreted as occurring in a single lens, the N Lens.

Previous interpretations of the Lik South deposit involved a number of north-south faults that divided the mineralization into several fault blocks. The drilling in 2008 and 2011 appears to demonstrate that most of these faults are either minor significance or non-existent.

In previous interpretations, the Lik South deposit has been separated from the Lik North deposit by an east-west fault, the Main Break Fault. The most recent drilling appears to demonstrate that this fault is less significant than previously interpreted. The A Lens and the N Lens may be continuous, although there is a change in plunge or dip of the mineralization at about the interpreted position of the Main Break Fault. This change in attitude is more akin to a sharp flexure or hinge rather than a fault.

It is noted that the massive sulphides provide more continuity than the wall rocks, for which the geology is complex and it is difficult to interpret much continuity in the enclosing rocks.

While the bulk of the sulphide is interpreted as being part of the A Lens in Lik South and the N Lens in Lik North, there are a number of other sulphide lenses. These are interpreted as lying both above and below the major lenses. The lenses above the A Lens in Lik South are important as they would have to be mined in an open pit to access the larger A Lens. Higher costs would apply to the mining of smaller lenses located below the A Lens.

A wireframe model was developed from the interpretations prepared on sections and is shown in Figure 11-1. The wireframe model for Lik South was constructed at a minimum grade of 3% Zn+Pb, while the wireframe model for Lik North was constructed at a minimum grade of 7% Zn+Pb. There is a portion of Lik North that lies within the preliminary Whittle pit shell which, if re-wireframed at 3% Zn+Pb, would not differ significantly from that at the 7% minimum. The wireframed mineralized domains were used to constrain interpolation of grades using drill hole assay composites within the wireframes.

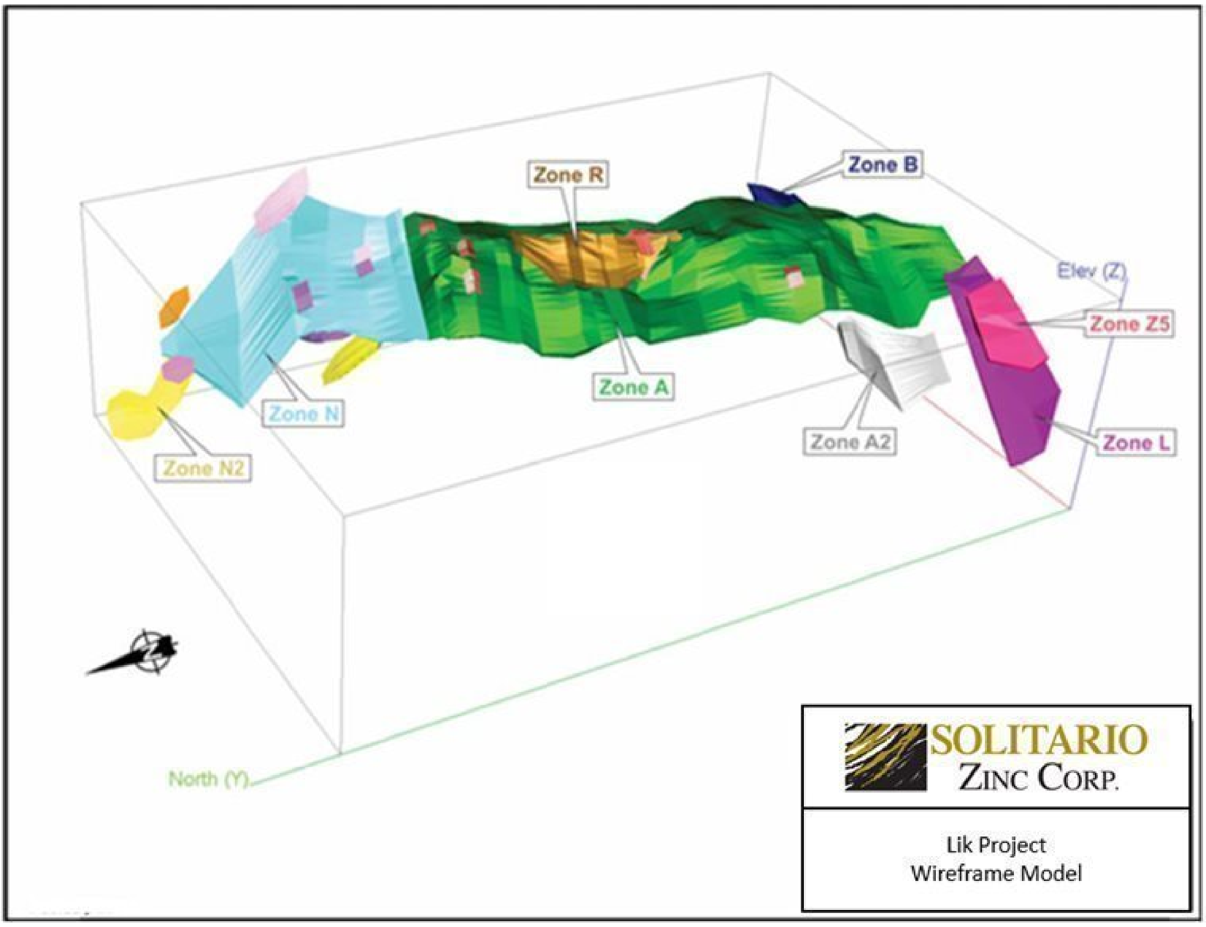

Figure 11-1: RPA Grade Shell

11.4 Cut-Off Grade

The cutoff grade used for reporting Mineral Resources considers surface mining methods only. A cutoff grade of 5% Pb+Zn is used which is based on current metals pricing. Economic parameters are based on the 2014 PEA which are reasonable economic parameters as of the effective date of this report.

11.5 Compositing and Statistics

The Lik assay database was checked for statistical outliers. While there are a few assays of both lead and zinc that are considered to be outlier values, there were too few high values to materially affect the average grade. For this reason, no cutting of high values was carried out on the lead and zinc assays. There were several high silver assays that were considered to be outlier values and these assays were capped prior to compositing at 320 g/t Ag.

Basic statistics for drill hole assays for the Lik South and Lik North deposits are listed in Tables Table 11-2 and Table 11-3, respectively. Only assays within the mineralized wireframes are included.

Table 11-2: Statistics of Drill Hole Assays - Lik South

Statistic	Length (m)	% Pb	% Zn	g/t Ag	g/t Ag Capped
N	2,414	2,414	2,414	2,414	2,414
Mean	1.28	2.62	7.97	48.35	45.25
Median	1.43	1.47	6.32	21.94	21.94
Max. Value	4.57	35.39	42.8	1,445.14	320.00
Standard Deviation	0.5	3.15	6.77	82.68	58.61
Coefficient of Variation	0.39	1.17	0.86	1.63	1.24

Table 11-3: Statistics of Drill Hole Assays - Lik North

Statistic	Length (m)	% Pb	% Zn	g/t Ag	g/t Ag Capped
N	360	360	360	360	360
Mean	1.12	3.16	9.37	48.24	47.92
Median	1.07	2.05	8.75	28.63	28.63
Max. Value	3.05	36.45	39.15	420.69	320.00
Standard Deviation	0.47	3.70	6.31	52.73	50.76
Coefficient of Variation	0.42	1.19	0.69	1.14	1.11

RPA composited assays into 3.05 m (10 ft) intervals down hole inside the mineralized wireframes, starting with the first assay down hole within the wireframe. Basic statistics for the composites are shown in Tables Table 11-4 and Table 11-5 and include composites of all lengths.

Table 11-4: Statistics of Drill Hole Composite Assays - Lik South

Statistic	Length (m)	% Pb	% Zn	g/t Ag
N	1,141	1,141	1,141	1,141
Mean	2.73	2.64	7.73	46.23
Median	3.05	1.82	6.74	27.20
Max. Value	3.05	23.88	35.64	320.00
Standard Deviation	0.75	2.58	5.33	54.00
Coefficient of Variation	0.28	0.96	0.68	1.15

Table 11-5: Statistics of Drill Hole Composite Assays - Lik North

Statistic	Length (m)	% Pb	% Zn	g/t Ag
N	143	143	143	143
Mean	2.55	3.09	8.86	43.79
Median	3.05	2.6	8.73	30.22
Max. Value	3.05	13.59	21.93	265.96
Standard Deviation	0.90	2.44	4.41	44.43
Coefficient of Variation	0.35	0.79	0.49	0.98

Composites less than 0.9 m (3 ft) were excluded from the variography. Statistics for the composited data with the small composites removed are shown in Tables Table 11-6 and Table 11-7. The similarity of the data set out in Table 11-4 to those in Table 11-6 and in Table 11-5 to those in Table 11-7 indicates that the elimination of the small composites did not affect the overall integrity of the composited database.

Table 11-6: Statistics of Lik South Drill Hole Composite Assays with Composites less Than 0.9m Removed

Statistic	Length (m)	% Pb	% Zn	g/t Ag
N	1,066	1,066	1,066	1,066
Mean	2.89	2.65	7.81	47.03
Median	3.05	1.85	6.81	28.83
Max. Value	3.05	23.88	35.64	320.00
Standard Deviation	0.45	2.56	5.28	54.40
Coefficient of Variation	0.16	0.96	0.67	1.15

Table 11-7: Statistics of Lik North Drill Hole Composite Assays with Composites less Than 0.9m Removed

Statistic	Length (m)	% Pb	% Zn	g/t Ag
N	126	126	126	126
Mean	2.83	3.06	8.93	44.39
Median	3.05	2.65	8.91	30.18
Max. Value	3.05	13.59	21.93	265.96
Standard Deviation	0.51	2.33	4.40	45.03
Coefficient of Variation	0.18	0.76	0.49	0.99

11.6 Variography and Kriging Parameters

RPA produced variograms using the 3.05 m (10 ft) composites within the mineralized domains, except for composites of 0.9 m (3 ft) or less. Variograms were reasonably well developed for the Lik South deposit, but not well developed for Lik North due to limited composite data. Downhole variograms were used to determine the nugget effect, which is 28% of the sill for zinc, 38% for lead, and 10% for silver. Directional variograms within the plane of the Lik South mineralized zones gave different ranges of influence for along strike, down dip, and perpendicular to dip directions, as shown in Table 11-8.

Table 11-8: Variogram Ranges - Lik South

Metal	Along Strike ft (m)	Range Down Dip ft (m)	Across Dip ft (m)
Zn	40 (12.2)	100 (30.5)	40 (12.2)
Pb	64 (19.5)	100 (30.5)	54 (16.5)
Ag	67 (20.4)	90 (27.4)	40 (12.2)

The parameters for the Lik South variograms were used for block grade interpolation in both Lik South and Lik North mineralized domains.

11.7 Block Model and Grade Interpolation

A block model was developed with blocks 50 ft x 50 ft x 10 ft high (15.24 m x 15.24 m x 3.05 m). Grade interpolation for both the Lik South and Lik North deposits was by ordinary kriging using the variogram parameters described in the previous section.

Interpolation was completed as a two-pass process. The first pass used search parameters of 200 ft x 200 ft x 25 ft (60.96 m x 60.96 m x 7.62 m) to cover drill hole spacing of mostly 100 ft (30.48 m) by 200 ft (60.96). Blocks required a minimum of two composites and a maximum of twelve composites. A second pass with a search of 600 ft x 600 ft x 50 ft (182.88 m x 182.88 m x 15.24 m) and minimum and maximum composite limits of one and twelve composites, respectively, was used to interpolate any blocks not interpolated in the first pass. Figures Figure 11-2 to Figure 11-4 are three sections that illustrate the block model.

11.8 Classification of Mineral Resources

A significant amount of diamond drilling has been completed on the Lik deposit. Drilling has been carried out on 200 ft (60.96 m) sections in the Lik South area, with holes mainly spaced at 100 ft (30.48 m) along section lines. The major part of the Lik South deposit is comparatively well tested and is considered to be an Indicated Mineral Resource. The portions outside this central area in the Lik South deposit, where drill holes are more widely spaced or where lenses are tested by only a few holes, are classified as Inferred Mineral Resource. Drill holes at Lik North are more widely spaced in general than at Lik South, and Lik North is therefore primarily classified as an Inferred Mineral Resource. A portion of the Lik North deposit that occurs within the preliminary pit shell is classified as an Indicated Mineral Resource.

Figure 11-5 shows the locations of the Mineral Resource classification blocks.

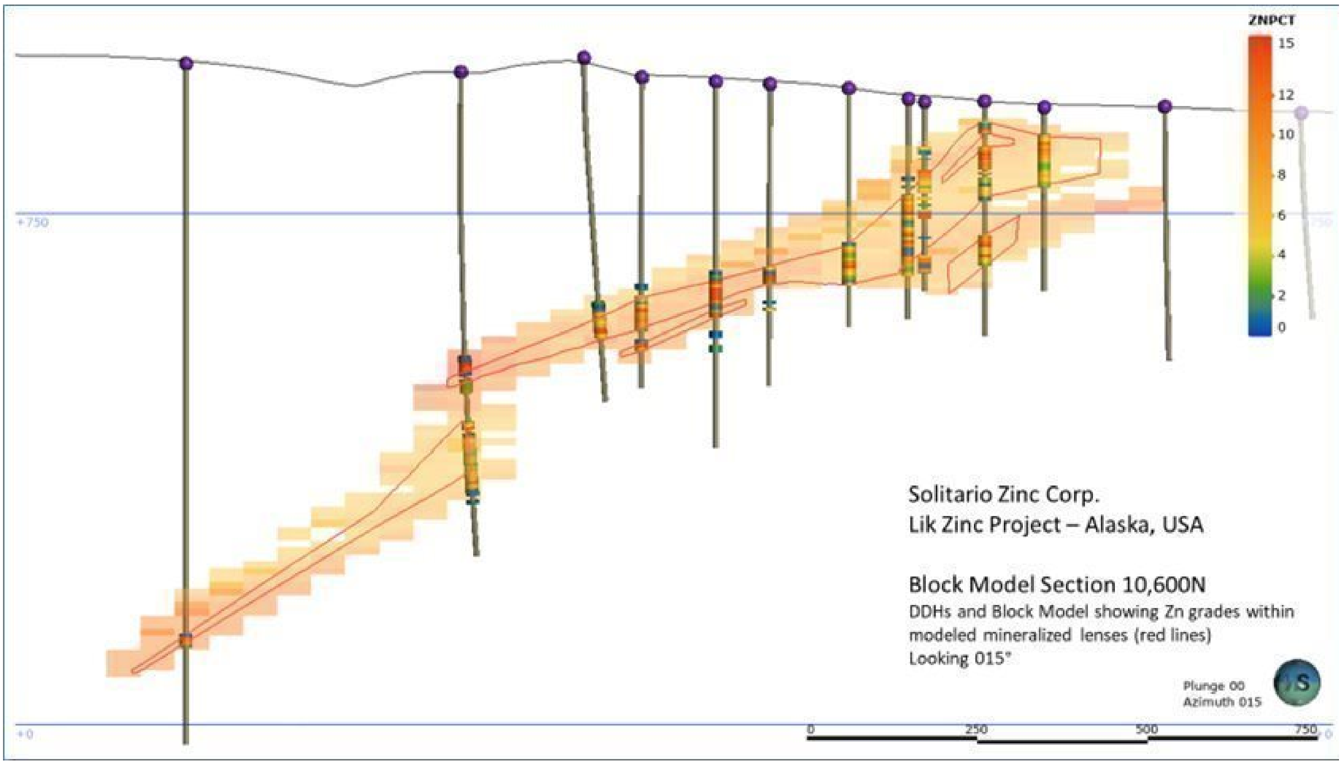

Figure 11-2: Block Model Section 10,600N

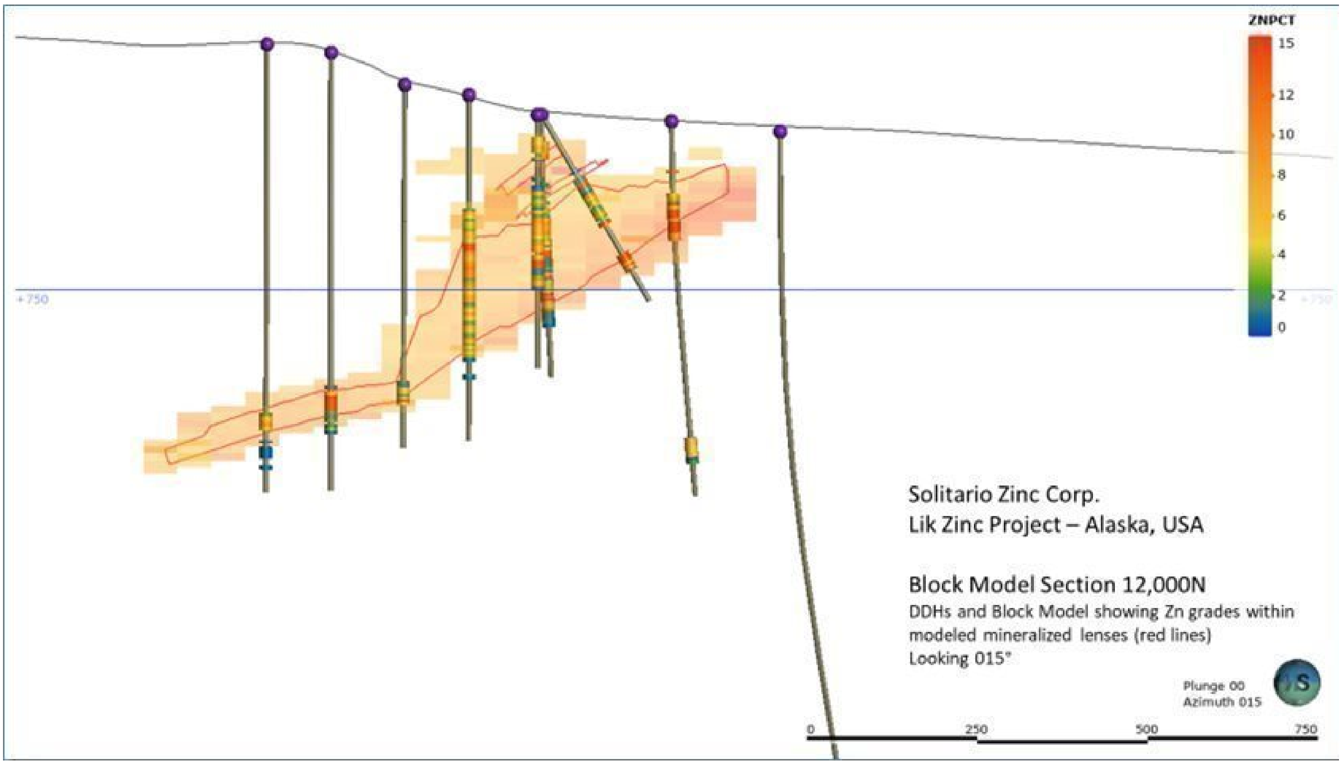

Figure 11-3: Block Model Section 12,000N

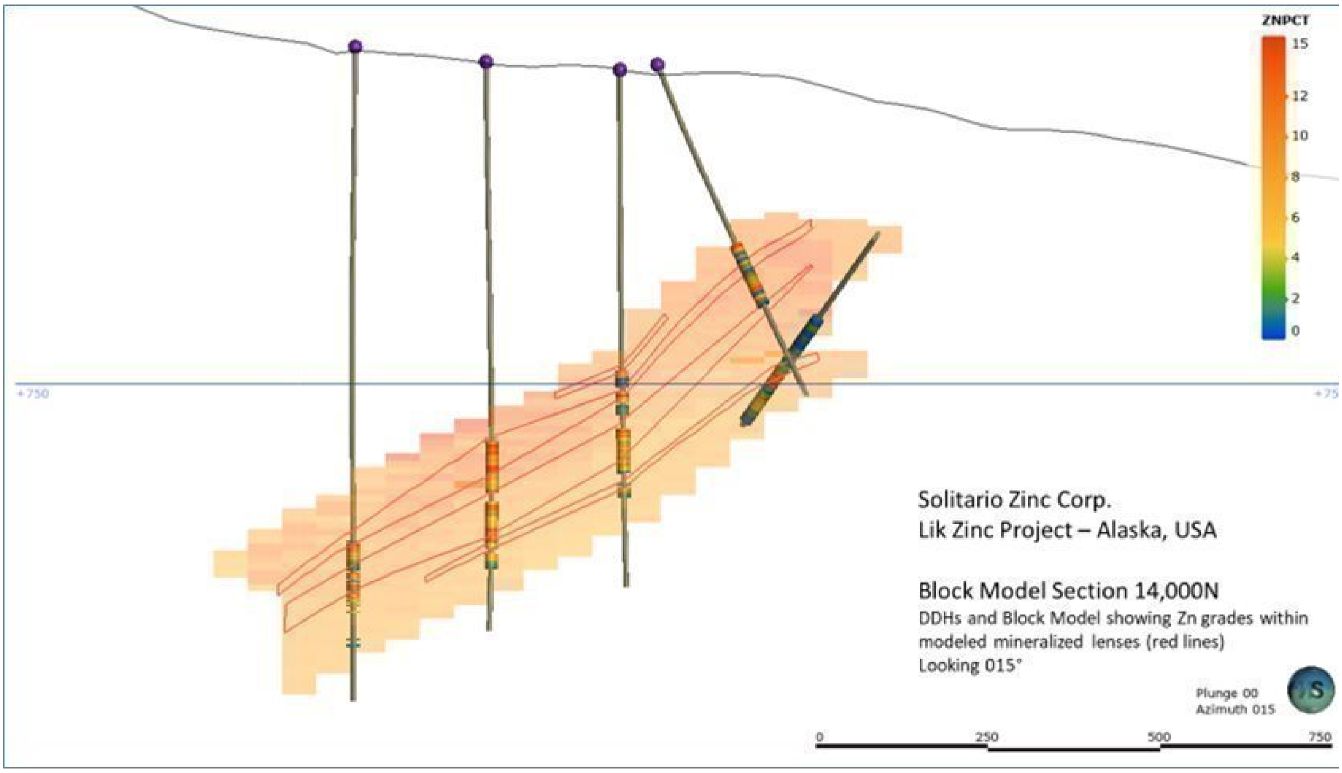

Figure 11-4: Block Model Section 14,000N

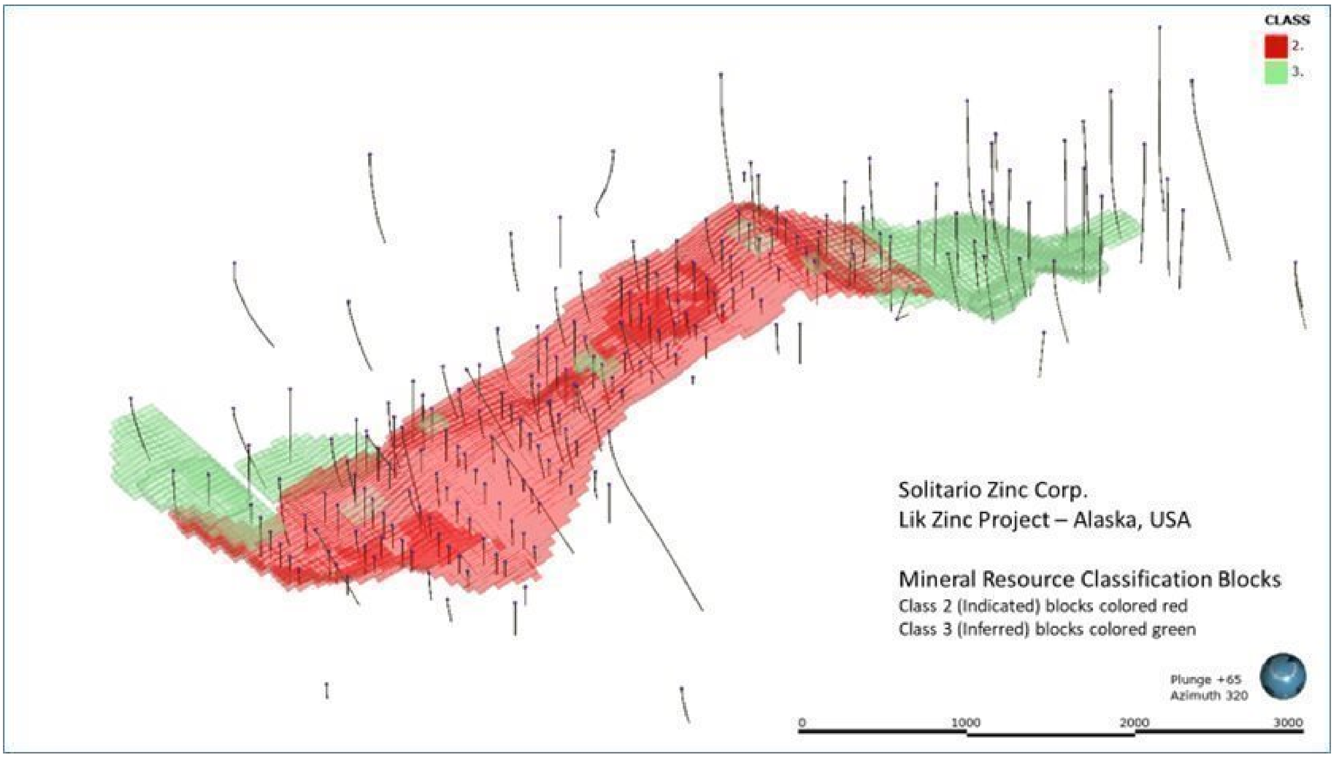

Figure 11-5: Location of the Mineral Resource Classification Blocks

11.9 Block Model Validation

The ordinary kriging block model was validated as follows:

- Visual inspection and comparison of block grades with drill hole composite and assay grades.
- Statistical comparison of the grades of blocks and composites.
- Check of ordinary kriging block model results by inverse distance squared (ID2).

WSP completed an audit of the RPA block model via visual comparison of original and 10ft composite drillhole assay grades (Zn, Pb and Ag) in section and in 3D. Mineralized intercepts were checked against modeled mineralized wireframes and surface topography. Estimated block grades were compared to composite grades, experimental directional variograms were created to evaluate RPA's estimation parameters. Block grades and classification was also reviewed using drillhole distance buffers. And mineralized domain geometries and volumes were compared against original domains modeled using Leapfrog Geo/Edge 2021.2.3. RPA's estimated resources are appropriately constrained and derived using estimation and classification parameters that are in-line with standard practice and yield expected results.

Basic statistics for block model block grades for the Lik South and Lik North deposits are listed in Table 11-9 and Table 11-10 respectively. Only assays within the mineralized wireframes are included.

Table 11-9: Statistics of Block Grades - Lik South

	ID^2			Ordinary Kriging		
Statistic	**% Pb**	**% Zn**	**g/t Ag**	**% Pb**	**% Zn**	**g/t Ag**
Mean	2.49	7.50	43.81	2.48	7.48	43.71
Median	2.18	7.17	39.47	2.24	7.27	41.07
Max. Value	14.21	28.31	244.41	11.60	20.91	221.71
Standard Deviation	1.54	2.82	35.81	1.38	2.45	33.47
Coefficient of Variation	0.62	0.38	0.82	0.56	0.33	0.77

Table 11-10: Statistics of Block Grades - Lik North

	ID^2			Ordinary Kriging		
Statistic	**% Pb**	**% Zn**	**g/t Ag**	**% Pb**	**% Zn**	**g/t Ag**
Mean	2.97	9.00	41.84	2.99	8.95	41.47
Median	2.89	8.89	36.73	2.92	8.89	38.98
Max. Value	10.36	18.78	214.64	9.62	18.78	200.78
Standard Deviation	1.29	2.92	31.59	1.18	2.61	29.01
Coefficient of Variation	0.43	0.32	0.75	0.40	0.29	0.70

A comparison of the ordinary kriging and ID^2 results is shown in Table 11-11. The results from the two different methods are very close, as the Lik drilling is on a very regular grid.

Table 11-11: Grade Comparison, ID^2 vs. Ordinary Kriging

Resource Classification	ID^2				Ordinary Kriging			
	Mt	% Zn	% Pb	g/t Ag	Mt	% Zn	% Pb	g/t Ag
Indicated	18.43	8.10	2.71	50.20	18.43	8.08	2.71	50.19
Inferred	5.63	8.47	2.62	37.82	5.63	8.43	2.63	37.77

In the opinion of RPA, the ordinary kriging block model provides a reasonable estimate of the Lik Mineral Resources at this stage.

11.10 Mineral Resources

To comply with the CIM Definitions of "reasonable prospects for economic extraction", WSP performed a pit optimization to assess mineralization that can be exploited by surface mining methods. Most of the resource in the Lik South and a portion of the resource in Lik North areas appear to have reasonable potential for open pit mining.

Table 11-12 shows the sensitivity of the potential open pit Lik South and North Mineral Resources to variations in cut-off grade.

Table 11-12: Sensitivity of the Lik South & North Potential Open Pit Mineral Resource Estimate to Variation in Cut-Off Grade

Cut-off	Indicated Mineral Resources				Inferred Mineral Resources			
% Pb+Zn	Mt	% Zn	% Pb	g/t Ag	Mt	% Zn	% Pb	g/t Ag
3%	17.78	8.03	2.66	50.0	2.80	8.62	2.72	38.8
5%	17.61	8.07	2.68	50.1	2.80	8.64	2.73	38.9
7%	16.21	8.34	2.80	51.5	2.69	8.76	2.79	40.1

11.11 Qualified Person's Opinion

The mineral resource estimate performed in 2014 by RPA has been audited by Mark Shutty for this current TRS. A comparable model was prepared using Leapfrog Geo/Edge 2021.2.3 software in February 2022.

As there has been no additional drilling or interpretation, the qualified person considers that model is appropriate for declaration of a mineral resource estimate.

12 Mineral Reserve Estimates

There are no Mineral Reserves declared for the Lik Project.

13 Mining Methods

This section of the report, Mining Methods, is included in the TRS for informational purposes, this section does not support a mineral reserve as there are no mineral reserves declared for the Lik project. The information provided is completely reliant on the 2014 PEA. The Qualified Person (QP) is including the 2014 PEA information because the data and analysis presented still applies to the Lik Project.

Conventional open pit mining methods were envisioned for the Lik Project in the prior 2014 PEA. An annual mine schedule was developed for the 2014 PEA that used a pit optimization shell for the basis of the excavation. The schedule targeted delivery of 2.0 million tons of mineralization to the mill over a 9+ year production life. Mine equipment and personnel requirements were developed based on the mine schedule.

The QP believes that the mine plan and schedule presented in the 2014 PEA are reasonable for the Lik Project.

14 Processing and Recovery Methods

This section of the report, Processing and Recovery Methods, is included in the TRS for informational purposes, this section does not support a mineral reserve as there are no mineral reserves declared for the Lik project. The information provided is reliant on the 2014 PEA. The Qualified Person (QP) is including the 2014 PEA information because the data and analysis presented still applies to the Lik Project.

An initial design for a 2.0 Mt per year on-site concentrator was documented in the 2014 PEA. The basis of the design is the test work documented in Section 13 of the 2014 PEA. This test work is also reproduced in Section 10 of this TRS. The PEA specifies a two-product froth flotation plant with a nominal capacity of 5,500 t/d or 2.0 M tons per year. Production rate of lead and a zinc concentrates is 153 t/d (56,000 t/a) and 641 t/d (234,000 t/a) respectively. These concentrates would be hauled by truck to the port facility where it will be stored for shipment to a suitable smelter.

15 Infrastructure

This section of the report, Infrastructure, is included in the TRS for informational purposes, this section does not support a mineral reserve as there are no mineral reserves declared for the Lik project. The information provided is reliant on the 2014 PEA.

The Lik project is located in a remote area with minimal supporting infrastructure and services. Current infrastructure consists of several small storage buildings, a bunkhouse/kitchen and a small air strip suitable for short takeoff and landing aircraft. This current infrastructure may support exploration operations, but it is not sufficient to support production mining.

16 Market Studies

No market study at this time has been prepared for the Lik Project. Metallurgical test work indicates that a lead concentrate and a zinc concentrate can be produced that would have a reasonable prospect of being a marketable concentrate. The terms of sale for both lead and zinc concentrates are closely tied to the lead and zinc metal prices. These metals are publicly traded in transparent markets where pricing and volumes are well known. This TRS uses the 3-year trailing average of the London Metals Exchange daily closing price which is $1.18/lb zinc and $0.91/lb lead.

17 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

Permitting for current explorations activities are current and are under the supervision of Teck. Travis/Peterson Environmental Consulting, Inc. (TPECI) performed baseline studies of the Lik Project which were documented in the 2014 PEA.

18 Capital and Operating Costs

Capital and operating costs were not estimated for this study.

19 Economic Analysis

No economic analysis was performed for this study.

20 Adjacent Properties

Teck Resources Limited (Teck) owns and operates the currently operating Red Dog Mine, a large lead zinc mine. As stated in Section 2, Teck owns a 50% interest in the Lik Project. Teck holds the mineral rights to the southern extension of the Lik deposit and refers to the extension area as the Su property and the mineralization as the Su deposit. Teck's 2020 Mineral Resource statement for Red Dog is shown in Table 20-1. The Red Dog District includes several different deposits.

Table 20-1: Teck Red Dog Mineral Reserves and Resources (31 Dec 2020)

Deposit	Tonnes (million)	% Zn	% Pb	g/t Ag
Mine Proven and Probable Reserves	46.0	12.9	3.6	67.5
Mine Indicated Mineral Resources	8.5	7.7	5.3	92
Mine Inferred Mineral Resources	9.1	12.5	4.5	88.3
District Inferred Mineral Resource	19.4	14.4	4.2	73.4

Teck holds several other deposits in the Brooks Range area not listed in Table 20-1. Tonnages of these deposits are not included in the above statements. These include Paalaaq, which is reported to contain 13 Mt grading 15% Zn, 4.3% Pb, and 96 g/t Ag (USGS – Alaska Resource Data File), and Anarraaq, which is reported to contain 18 Mt grading 18% Zn and 5.4% Pb, and 85 g/t Ag (Kelley et al,. 2004). Aktigiruq is an early-stage target north of Anarraaq with minimal drilling to date. Teck classifies this discovery as advanced exploration. However, the deposit may be one of the largest and the highest-grade Zinc deposits in world with an early estimate of possible resources in the range of 80-150 million tonnes grading 16-18% zinc.

The resource figures provided in this section, Section 20 Adjacent Properties, have not been reviewed by the Qualified Person and may not be indicative of the Lik Property.

21 Other Relevant Data and Information

The Qualified Persons did not rely on any other information not already disclosed in this TRS

22 Interpretation and Conclusions

22.1 Results

The Lik project contains an indicated resource of 17.6 million tonnes at an average grade of 8.07 %Zn and 2.68 %Pb. These resources have a reasonable economic potential for extraction via typical surface mining methods and processed into a marketable concentrate using standard flotation concentration processes. Solitario owns a 50% interest in the Lik property and continues to work with Teck under a joint operating agreement to continue to maintain and explore Lik.

22.2 Significant Risks

The Lik Project is subject to risks and uncertainties typical of mineral exploration projects, particularly risk regarding commodity prices and the metals equity markets. Lower than forecasted metals prices or lack of equity market interest or activity could render the project uneconomic or reduce access to project financing.

Specific risks to additional project exploration and subsequent mine development include the ability to successfully permit exploration and development activities. Maintaining a social license with the local peoples to continue operate and explore the property.

22.3 Significant Opportunities

There is exploration potential located on the Lik Project and the opportunity exists to better classify the current resource and add additional resources. Recent exploration campaigns suggest additional mineralization may be present in western area of the current mineral claim holdings, which represents opportunity for additional exploration.

Further work on plans and potential operating agreements is warranted as a reduction in the pre-production capital will result in benefits to the project economics. These must be quantified with both advances in operating agreements and reevaluation of operating and capital costs in 2022.

23 Recommendations

It is recommended in the short term that exploration be conducted over unexplored areas on the property including:

- Complete geophysical surveys over the entire land position.
- Continue geologic mapping to use for interpretation of prospective areas for drilling and use in conjunction with geophysics to prioritize targets.
- Drilling.
- Interpretation of exploration results and update the estimation of resources.

This exploration strategy will be an integral part of the long-term objective of development of Lik. Ultimately The preparation of a feasibility study will be required in order to reach a production decision. This will require substantial investment in additional resource definition drilling, metallurgical studies and a multitude of other technical work that will require design and approval by the JV partners.

Three of the short-term exploration elements discussed above are incorporated in the approved 2022 exploration program. The 2022 program includes continued geologic mapping, geophysical surveying and drilling of three core holes totaling 650 meters for an estimated program cost of US$1.168 M of which 50% will be to Solitario's account.

In addition, a series of trade-off studies for various operating alternatives for the property could quantify the potential benefits of developing the project as a joint venture by defining the benefits to both JV partners. The scoping level studies needed to better define these benefits for all parties are relatively inexpensive, at an estimated budget of $100,000.

24 References

Britton, J. M., 2010, Summary Status of Environmental Work Program, Zazu Metals Corporation.

Cinits, R., et al., 2007, Red Dog Mine Review, Alaska, NI 43-101 Technical Report, Prepared by AMEC for Teck Cominco Limited (March 9, 2007).

Cox, D.P. and Singer, D.A., 1992, Mineral Deposit Models. U.S. Geological Survey Bulletin 1693.

Dumoulin, J.A., et al., 2004, Depositional Setting, Correlation and Age of Carboniferous Rocks in the Western Brooks Range, Alaska. Econ. Geol. Vol. 99, pp. 1355-1384.

Gow, N. N., Roscoe, W. E., and Scott, K. C., 2009, Technical Report and Mineral Resource Estimate on the Lik Deposit, Northern Alaska, U.S.A., Prepared by RPA for Zazu Metals Corporation (May 13, 2009).

Gow, N. N., 2007, Technical Report on the Lik Deposit, Northern Alaska, U.S.A. Report for Zazu Metals Corporation (August 20, 2007).

G&T Metallurgical Services Ltd., 2008, Preliminary Metallurgical Assessment of the Lik Deposit (May 15, 2008).

JDS Energy and Mining Inc, "Preliminary Economic Assessment, Technical Report Zazu Metals Corporation, Lik Deposit Alaska, USA" Effective Date: March 3, 2014

Lounsbury & Associates, Inc., 2009, Lik Deposit Access Road, Preliminary Corridor Analysis Report, Prepared for Zazu Metals Corporation (October 2009).

MacInnes, S., 2008, 2008 CSAMT/NSAMT Geophysical Survey, Lik Deposit, De Long Mountains, Alaska. Report for Zazu Metals Corporation by Zonge Engineering & Research Organization, Inc., Tuscon, Arizona.

Moore, D.W., et al., 1986, Geologic Setting and Genesis of the Red Dog Zinc-Lead-silver Deposit, Western Brooks Range, Alaska. Econ. Geol. Vol. 99, pp. 1696-1727.

Perkins, J.J., and Lyle, G., 2007, Updated Title Report-LIK Property, Our File No. 6078.1. Memorandum by Guess & Rudd for Zazu Metals Corporation (December 19, 2007).

PND Engineers Inc., 2009, Capacity Analysis for the Delong Mountain Port Facility in Support of Developing the Lik Deposit (April 2009).

Roscoe Postle Associates Inc, "Technical Report and Mineral Resource Estimate for the Lik Project, Northwestern Alaska, USA" Effective date: June 12, 2012.

Scherkenbach, D.A., Hahn, G.A. and Lown, D.J., 1985, Lik-Delong Mountains Project, 1985 Annual Progress Report. Report for Noranda Exploration, Inc.

Scott, K.C., et al., 2010, Preliminary Assessment of the Lik Project, Northwest Alaska, U.S.A. Report for Zazu Metals Corporation (April 8, 2010).

SGS Mineral Services, 2010, An Investigation into Flotation of Material from the Lik Deposit, Prepared for Zazu Metals Corporation (January 21, 2010).

Travis/Peterson Environmental Consulting, 2008, 2008 Work Plan Environmental Consulting and Management Lik Deposit, Alaska, Prepared for Zazu Metals Corporation (May 2008).

Travis/Peterson Environmental Consulting, 2008, Letter to Joe M. Britton, Zazu Metals Corporation, Environmental Program Schedule (February 14, 2008).

Young, L., 2004, A Geologic Framework for Mineralization in the Western Brooks Range, Alaska. Econ. Geol. Vol. 99, pp. 1281-1306.

Table 24-1 Key Acronyms and Abbreviations

CIM	Canadian Institute of Mining Metallurgy and Petroleum
ha	hectare
km	kilometers
M	Millions
Mt	Millions tonnes
m	meter
Pb	Lead
RPA	Roscoe Postle Associates Inc.
SEC	United States Securities and Exchange Commission
Solitario	Solitario Zinc Corp.
TRS	Technical Report Summary
Zn	Zinc

25 Reliance on Information Provided by Registrant

The Qualified Persons responsible for this TRS has relied on the Registrant (Solitario Zinc Corp) for the following information.

- Markets – information related to market studies/markets for product, market entry strategies, marketing and sales contracts, product valuation, product specifications, refining, and treatment charges, transportation costs, agency relationships and material contracts. This information is used in supporting the resource estimate in Section 11.
- Legal Matters – information relating to the corporate ownership interest, mineral tenure, surface rights, water rights, royalties, encumbrances, easements, violations and fines, permitting requirements, monitoring requirements. This information is used in Section 3, and supports the mineral resource in Section 11.
- Environmental Matters – information relating to baseline studies, environmental permitting and monitoring, ability to retain current permits, emissions control, closure planning and bonding and regulations pertaining to protected species and habitats. This information is used in Section 17 and supports the mineral resource in Section 11
- Stakeholder Accommodation – information relating to social and stakeholder baseline studies, other organizations, non-governmental organizations, and community relations plans. This information was used to support the mineral resources in Section 11.
- Governmental Factors – information related to government royalty clams supports the mineral resource estimate in Section 11.