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NI 43-101 TECHNICAL REPORT ON THE SBH PROPERTY BIRCH MOUNTAINS, ATHABASCA REGION, ALBERTA, CANADA

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1 Summary

1.1 Issuer and Purpose

This Technical Report has been prepared on behalf of Critical Minerals Americas Inc. ("CMAI" or the "Company"), by APEX Geoscience Ltd. ("APEX"). CMAI is a private Ontario/Canadian company incorporated to advance development of long-term domestic supplies for critical minerals, metals, rare earth elements (REEs) and other notable critical metals such as lithium (Li), and scandium (Sc). CMAI holds 100 per cent (%) interest in nine (9) contiguous Alberta rock-hosted minerals permits collectively comprising an aggregate of 46,666 hectares (ha) known as the SBH Property (the "Property").

This National Instrument (NI) 43-101 Technical Report ("the Report") details the historical work and developments of historical Mineral Resource Estimates, Mineralized Zones, and conceptual exploration targets discovered within the Property boundaries to date. The intent and purpose of this Report is to provide a technical summary of available geological, geophysical and geochemical information, and to summarize the exploration status of the SBH Property which CMAI recently acquired to re-activate the exploration and advancement of this critical metal and mineral enriched black shale Project.

This Report was prepared by Qualified Persons (QPs) in accordance with disclosure and reporting requirements set forth in NI 43-101 Standards of Disclosure for Mineral Projects (effective May 9, 2016), Companion Policy 43-101CP Standards of Disclosure for Mineral Projects (effective February 25, 2016), Form 43-101F1 (effective June 30, 2011) of the Canadian Securities Administrators, the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Mineral Exploration Best Practice Guidelines (November 23, 2018), the CIM Estimation of Mineral Resources, and Mineral Reserves Best Practice Guidelines (November 29, 2019) and the CIM Definition Standards (May 10, 2014). The Effective Date of this Report is July 1, 2025.

1.2 Authors and Site Inspection

The authors of this Report (the "Authors") include Mr. Michael Dufresne, M.Sc., P.Geol., P.Geo. and Mr. Roy Eccles, M.Sc., P.Geol., P.Geo. of APEX. Both Authors are independent of CMAI and are QPs as defined by CSA's NI 43-101. The Authors have been involved in all aspects of mineral exploration and mineral resource estimations for precious and base metal mineral properties and deposits along with critical minerals properties in Canada and internationally.

Recent site visits by Mr. Dufresne to the SBH Property were completed in November 2022, and in September 2023. During the site visit on November 17-18, 2022, Mr. Dufresne observed the Property from a helicopter and confirmed the locations of 9 historical drill pads for 11 drillholes in the Lower Buckton, Buckton South and Asphalt mineralized zones. Mr. Dufresne conducted a second site visit on September 21, 2023, during the CMAI outcrop sampling program and supervised APEX personnel conducting an outcrop trenching and sampling program.

1.3 Property Location, Description, and Access

The SBH Property is located on the eastern slopes of the Birch Mountains of Northeastern Alberta, approximately 120 kilometres (km) north of the city of Fort McMurray, Alberta, in the Athabasca oil sands region.

The Property is directly accessible by winter roads and air (fixed-wing and helicopter) from the city of Fort McMurray, Alberta. Fort McMurray is approximately 450 km by road North of Edmonton and is served by regular daily commercial flights from Edmonton, Calgary, Toronto and other communities. The Birch Mountain Airstrip, a small airstrip managed by Alberta Sustainable Resource Development Forest Protection Division, is located within the northeastern portion of the SBH Property.

The SBH Property is held 100% by CMAI, and there are no royalties due to any third parties other than the Provincial Mining Royalty due to the Province of Alberta levied against production revenues.

1.4 Geology and Mineralization

The Property falls in the Northwestern portion of the Western Canada Sedimentary Basin near the erosional contact with the Precambrian crystalline basement rocks of the Canadian Shield. The Property is located immediately northwest of the Fort McMurray and Fort McKay Athabasca oil sands operations. The Property is located along the eastern portion of the Birch Mountains which are underlain by the Upper Cretaceous Colorado Group and Lower Cretaceous Mannville Group sedimentary sequences. Known mineralization in the SBH Property is hosted in metalliferous black shales in the Labiche (Lea Park), Second White Speckled (Specks), and the Shaftesbury (Belle Fourche and Fish Scales) formations. The Second White Specks Formation is the most carbonaceous of the shales and is known to be the best mineralized black shale, at least in terms of base metals, found in Northeastern Alberta to date.

The Labiche, Second White Specks and Shaftesbury formations are stratigraphically uniform and extend laterally under much of the entire SBH Property area, as proven by Property-wide subsurface stratigraphic correlations using existing oil and gas wire-line logs, and historical 1997-2012 exploration drilling results.

The three known mineralized zones on the Property are: the Lower Buckton Zone, the Buckton South Zone and the Asphalt Zone. Mineralization in these zones consists of stratabound enrichment of one or more of molybdenum (Mo), nickel (Ni), vanadium (V), zinc (Zn), copper (Cu), cobalt (Co), silver (Ag), gold (Au), uranium (U), REEs, yttrium (Y), Li, thorium (Th) and Sc, hosted in a continuous 100-150 metre (m) thick “package” of flat-lying black shale formations. The Second White Specks Formation shale is the most carbonaceous and has more elevated base metal grades. All three formations have significant REE content, along with elevated Li-Sc in the Fish Scales/Belle Fourche (Shaftesbury Shale) Formation.

The uppermost bedrock units, the Labiche and Second White Specks formation shales, have been the Company’s principal focus to date. For the most part, none of the metals are present in sufficiently high enough concentration to be attractive exploration targets on a single element basis, however, the collective metal assemblage (polymetallics, REEs and critical specialty metals) may represent sufficient mineralization to support future mineral resource and economic studies provided the metals can be efficiently recovered on a combined basis.

These mineralized zones are based on historical drilling, soil and rock sampling, and have been retained by CMAI and APEX to facilitate referencing prior results to modern exploration and reporting herein and going forward.

1.5 Historical Exploration

Polymetallic potential of the Upper Cretaceous shale units in the Birch Mountains was investigated by a number of companies during the 1990’s and into the early to mid 2000’s. Much of the current Property area and surrounding areas were actively explored by Tintina Mines Ltd. (Tintina) and Dumont Nickel Inc. ("Dumont" later changed to DNI Metals Inc. "DNI") between 1993-1998 and 2007-2014, respectively.

Tintina discovered the metal bearing black shales in 1995 while searching for metal bearing permeability traps in redox fronts across northeast Alberta. Tintina discovered several readily accessible, modest grade, near surface metal enriched zones in a stacked sequence of black shales but the metals discovered could not be collectively recovered by the then available recovery technologies. Tintina ceased its exploration activities in 1999 and allowed its permits to subsequently lapse.

There was no further exploration activity in the Property area until 2007 when a data review led to the 2008 staking of a large portion of the Property area by Dumont (later DNI) motivated by technological advances made in the mid 2000's in industrial scale application of bioleaching to economic collective bulk extraction of low-grade metals from black shales potentially offering novel opportunities for exploitation of the metals-rich black shale deposits in northeastern Alberta.

DNI actively advanced prior discoveries through considerable work during the period 2007-2014 including soil and rock sampling, drilling, leaching test work (including bioleaching, acid leaching and column testing), several historical Mineral Resource Studies, and a historical Preliminary Economic Assessment (PEA) in 2014. The majority of the Buckton Zone falls outside of the current SBH Property boundaries, with approximately 87.1% of the 2013 historical Updated and Expanded Mineral Resource for the Buckton Zone located north of the current SBH Property boundary. The portion of the Buckton Zone that falls within the current SBH Property is known as the Lower Buckton Zone.

1.6 Recent Exploration

Exploration by CMAI at the SBH Property from 2022 to the Effective Date of this Report has consisted of data compilation, LiDAR (light detection and ranging) imagery interpretation of portions of the Property, a B-zone soil sampling program, a bulk sampling program, and the calculation of conceptual exploration targets.

CMAI has identified three mineralized zones on the Property with drilling: the Lower Buckton Zone, the Buckton South Zone and the Asphalt Zone. These zones were delineated based on historical soil and rock sampling, along with some drilling, and have been retained by CMAI to facilitate referencing prior results and for the purpose of exploration and reporting. During the 2023 exploration program, CMAI conducted a soil sampling program over areas underlain by the Labiche, Second White Specks, and Shaftesbury formation shales. This program successfully expanded on the prior findings from historical programs. A bulk sampling program was also completed from surface outcrops of the Labiche and Shaftesbury formation shales for metallurgical test work and creation of standard reference materials. The results of the Canadian Centre for Mineral and Energy Technology (Canmet) bioleaching work program that is in progress are not available as of the Effective Date of this Report.

1.7 Conceptual Exploration Targets

Exploration targets were developed to provide a conceptual evaluation of the potential size and grade of mineralized shale horizons within the Property. Conceptual exploration targets were calculated for the Lower Buckton, Buckton South and Asphalt zones for each of the laterally continuous LaBiche, Second White Specks, and the Belle Fourche/Shaftesbury Formations. These exploration targets were prepared by APEX personnel under direct supervision of Mr. Dufresne, M.Sc., P.Geol., P.Geo. of APEX. Mr. Dufresne takes responsibility for the exploration targets detailed herein.

The exploration targets' lateral extents were calculated centered around historical drilling at each Lower Buckton, Buckton South and Asphalt zones respectively, and extended laterally until the perimeter equated between 625 and 750 metres above sea level (masl) and restricted by the SBH Property boundary. The 625 masl elevation contour approximately represents the basal erosional line of the Second White Specks Formation. The 750 masl contour defines an approximate maximum of 100 m of overburden and Labiche Formation. Local adjustments of a maximum of 20 m of elevation were made based on historical field observations, drilling, and historical mapping.

To calculate the ranges of raw tonnages, the average thickness of each formation within the target area was determined from the mean length of formation intercepts observed in historical diamond drillholes. For the Lower Buckton Formation, intercepts from drillhole 7BK03, located immediately north of the Property, were also included in the calculation due to the continuity of stratigraphy across the boundary.

The lateral extent of each formation was then multiplied by the calculated average thickness to derive a representative formation volume. To reflect inherent geological variability and uncertainty in thickness and continuity, a range of volumes was established by applying a ±20% adjustment to the calculated average volume.

These volume ranges were subsequently converted to tonnage by applying representative specific gravity (SG) values for each formation. The resulting tonnage ranges provide the basis for subsequent estimates of elemental content within the shales.

Elemental grades for the exploration target were estimated from historical multi-element geochemical assays. For each formation at each exploration target, the length-weighted average grade of the sampled drillhole intercepts was calculated for the suite of REEs and critical metals under consideration. To reflect uncertainty in the available data, a grade range was established by applying a ±20% adjustment to the calculated average for each element.

Contained metal ranges were derived by multiplying the minimum grade with the minimum tonnage and the maximum grade with the maximum tonnage for each formation at each target area. This approach provides a conceptual range of potential contained metal for each element within the black shale units.

The Lower Buckton exploration target contains a range of approximately 2,327 – 3,491 million metric tonnes (Mt) of total black shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury formations. To calculate the estimated metal content of the Lower Buckton exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 7BK06 and 7BK03.

The Buckton South exploration target contains a range of approximately 10,257 – 15,384 Mt of total black shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury formations. To calculate the estimated metal content of the Buckton South exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 12BK01, 12BK06, and 12BK07.

The Asphalt exploration target contains a range of approximately 6,898 – 10,347 Mt of total black shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury formations. To calculate the estimated metal content of the Asphalt exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 11AS-01, 11AS-02, 7AS01, and 7AS02.

Minimum and maximum grades for 25 elements are presented in Section 10 of this Report. The elements include Mo, Ni, U, V, Zn, Cu, Co, La, Th, Li, and all REEs except for Promethium. The SBH Property exploration targets' potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The exploration targets expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

1.8 Metallurgical Test Work

Several historical laboratory-scale metallurgical test programs have been undertaken on and around the SBH Property. Initially, metallurgical test work focused on recovering nine metals from the Second White Specks Formation. Subsequent studies expanded this scope to include the Labiche and Shaftesbury formations, as well as the recovery of REEs and Li. DNI's various leaching test work programs consisted of the following:

- Initial bottle roll cyanidation tests conducted at Activation Laboratories Ltd. (Actlabs) by DNI on siliciclastic bone bed samples from 2009 field sampling.
- Sulphuric acid leaching tests conducted at Actlabs by DNI on select samples of Second White Specks Formation shale from litho-section Asphalt-H, from 2009 field sampling.
- Bio-leaching test work conducted by the French Geological Survey (Bureau de Recherches Géologiques et Minières - BRGM) on select samples of Second White Specks shale from Litho-Section Asphalt-H, from 2009 field sampling.
- Bio-organic culturing, adaptation and leaching test work conducted by the Alberta Research Council (ARC) on select samples of Second White Specks shale from Litho-Section Asphalt-H, from 2009 field sampling.
- Bio-leaching amenability testing on surface trench sample BAT456 from late 2010 at the ARC.
- Bio-leaching amenability tests 2011-2012 at Alberta Innovates Technology Futures (AITF formerly the ARC) – on composite drill core samples BK1, BK2, BK3, BK4, BK5, and a blank, BKL.
- Canmet MINING's stirred tank and column bio-leaching test program in 2013.

In general, the metallurgical test work indicates that the metals of interest within the Second White Specks shale can be extracted using either bio-leaching or acid leaching, with most metals showing reasonable recoveries.

The sulphuric acid leaching tests conducted by DNI at Actlabs in 2009-2010 successfully demonstrated that:

- A collective group of metals can be extracted from the shale by simple leaching under conditions generally simulating bio-heap leaching;
- High recoveries can be achieved for Ni - U - Zn- cadmium (Cd) - Co, and middling recoveries for Cu-Li;
- Recoveries for Mo-V are poor, but can be enhanced by varying the leaching parameters;
- REEs and rare metals contained in the shale, including Li, also report as co-products during leaching; and
- The Second White Specks shale is amenable to bio-heap leaching, provided the shale contains bio-organisms suitable for bio-heap leaching and barring any toxicity presented to bio-cultures by the geochemistry of the shale.

Subsequent bio-leaching test work completed by the ARC in 2009-2010, using bio-organisms cultured from the Second White Specks shale demonstrated that bio-organisms capable of growing under bio-leaching conditions naturally exist in the Second White Specks shale and that enrichment cultures can be obtained from the shale whose adaptation to the shale is immediate, and that the shale's geochemistry is not toxic to the bio-organisms and does not inhibit start-up of bacterial growth. The test work overall demonstrated that the Second White Specks shale is amenable to bio-leaching and to abiotic leaching in sulphuric acid, and that a collective group of metals can be extracted (recovered) from it.

The test work was expanded to include the Labiche and Shaftesbury shales. All three formations yielded similar positive result and indicate that the mineralization is not confined to just the Second White Speckled and Labiche formations, it also extends to the underlying Shaftesbury Shale, which had previously received limited attention and was omitted from the mineralized zones. Conclusions from the test work include:

- Test work results from different facilities concurred that all of the metals-REEs are held in the shale mostly in ionic forms which are easily liberated through acidification, rather than in sulphides requiring aggressive digestion, a conclusion corroborated by prior study of micro mineralogy.
- The results show that even a mild acidification relying on carbon dioxide (CO_2) will liberate the collective metals, offering opportunities to rely on CO_2 as a pre-treatment to additional acidification through sulfuric acid to follow.
- The test work from Canmet noted that abiotic leaching can achieve equivalent, albeit somewhat lower, recoveries, but that leaching duration is considerably faster than biotic processing. The foregoing recommended that future test work assess benefits of faster recoveries from abiotic processing, despite somewhat lower recoveries, in future economic assessments for potential mining operations.

A summary of the best metal recoveries achieved during the bio-leaching tests from the Labiche shale, as reported by AITF, are as follows: Mo-57%, Ni-82%, U-78%, V-10%, Zn-76%, Cu-65%, Co-80%, Li-41%. Recoveries for specialty metals and REEs, as calculated by DNI (based on the difference of metal content between head sample feed material and final tail residues per analytical results from AITF's test work), range as follows: lanthanum (La) -13%-20%, cerium (Ce) -21%-28%, praseodymium (Pr) -28%-34%, neodymium (Nd) -35%-41%, samarium (Sm) -49%-53%, europium (Eu) -55%-59%, gadolinium (Gd) -61%-64%, terbium (Tb) -60%-63%, dysprosium (Dy) -61%-65%, holmium (Ho) -58%-62%, erbium (Er) -51%-55%, thulium (Tm) -53%-57%, ytterbium (Yb) -42%-47%, lutetium (Lu) -53%-57%, Y-56%-59%, Sc-28%-37%, Th-32%-34% (Sabag, 2012).

A summary of the blended Second White Speckled Formation and Labiche Formation metal recoveries achieved during the Canmet stirred-tank experiments are listed as follows: Mo-3%, Ni-64%, U-70%, V-7%, Zn-52%, Cu-25%, Co-72%, Li-17%, La-20%, Ce-30%, Pr-40%, Nd-43%, Sm-47%, Eu-61%, Gd-63%, Tb-65%, Dy-65%, Ho-64%, Er-62%, Tm-60%, Yb-58%, Lu-55%, Y-67%, Sc-24%, and Th-13% (Cameron et al., 2014).

The Canmet test work demonstrated that recoveries of the light rare earth elements (LREEs) will be lower than those for heavy rare earth elements (HREEs) from the blended Asphalt Zone shale samples using conventional bioleaching. A significant proportion of the LREEs examined are associated with recalcitrant mineral phases that are not easily leached under oxidative conditions that would normally be expected to occur under heap bioleaching conditions (i.e. residual phases). It also noted that Cerium is expected to be the most recalcitrant with >30% of the element reporting to the most recalcitrant residual phase.

The sequential leaching tests also showed that nickel, uranium, and cobalt are the most amenable to heap bioleaching, due to a higher proportion of those metals being hosted by carbonate/exchangeable, ligand (labile carbon-associated) and sulphide phases. The tests also showed that vanadium and molybdenum will be the most difficult metals to recover, with ~90% of vanadium associated with the most recalcitrant phases that are not leached effectively at pH 2.

The stirred tank leaching tests showed that leaching of metals from the black shale occurs very rapidly, confirming what had previously been shown by all other leaching and bioleaching tests conducted at the BRGM, AITF and Actlabs. The Canmet column leaching test work was successful in demonstrating that it is technically feasible to leach REE and non-REE metals from the black shale samples tested (Second White Specks Formation shale) under conditions designed to replicate the environment within a heap bioleaching operation.

Canmet issued its final report in 2014, and no further work has been carried out since to expand on its findings, and those of the AITF, to advance collective metals recovery processing metrics toward testing of larger samples (bulk samples) with the natural view of advancing development of the potential recovery of metals from the enriched Alberta black shales at the Property.

1.9 Conclusions and Recommendations

Based on the results obtained from the current and previous exploration work conducted on the SBH Property, the following exploration work programs are recommended at the Buckton South, and Asphalt Zones. A two-phase work program is recommended, with Phase 2 exploration contingent on the positive results of Phase 1.

Phase 1

1) Carry out an HQ diameter diamond drilling program with the goal of defining an initial 2 billion tonnes of mineralized black shale material from the Buckton South and Asphalt target areas, respectively. An initial 4,000 m of drilling at 1,200 m drill collar spacing is planned in order to obtain drill core samples from the Labiche, Second White Specks and Shaftesbury Formations for analysis and metallurgical test work. Drilling will start where the historical drillholes were first located and then expand laterally. Drillhole lengths are planned at 120 m depth but will vary due to the thickness of the black shale units and overburden thicknesses.
2) A surface field program with soil and rock creek outcrop sampling and mapping should be conducted south of the Asphalt area to confirm the presence and grade of mineralized Labiche, Second White Specks, and Shaftesbury Formation material present. Several deep creeks in the southern portion of the Property have exposures of the Labiche, Second White Specks, and Shaftesbury formations.
3) Carry out follow up bioleaching metallurgical test work from fresh drill core samples to determine methods at increasing the overall recovery and the recovery rates of each metal and REE's contained in the Labiche, Second White Specks and Shaftesbury formations black shale units.
4) Construct at minimum a mineral resource estimate (MRE) for the Buckton South and Asphalt targets with an associated technical report that will eventually lead to a Preliminary Economic Assessment (PEA) of the Property.

The total estimated cost of Phase 1 is CAD$4,865,000 (Table 1.1).

Phase 2

Based on the positive results obtained from the Phase 1 work program, it is recommended that the following work programs be carried out:

1) Infill HQ diameter diamond drilling program at 600 m spacing be carried out with the goal of upgrading the Inferred mineral resources to the Indicated Mineral Resource category for both the Buckton South and Asphalt target areas. Several twin drillholes to be completed in order to collect sample material for metallurgical test work.

2) Carry out large-scale metallurgical test work program consisting of pilot-scale bioleaching (heap pads).
3) Carry out initial geotechnical and hydrological studies
4) Initiate environmental and wildlife studies

The Phase 2 drilling program plans to have a minimum two drillholes to intersect the complete thickness of the Shaftesbury Formation at Buckton South and Asphalt target areas in order to obtain samples for analysis. Previous drilling programs did not fully drill through the Shaftesbury Formation. As such, this initial phased drilling program will provide analytical data to determine the potential of hosting economic amounts of polymetallic mineralization, Li, Sc, and REEs and inclusion in a future updated resource estimate or PEA for both target areas.

The total estimated cost of Phase 2 is CAD$6,770,000 (Table 1.1).

Table 1.1 Proposed work program for the SBH Property.

Phase 1 Technical Program	
Activity	Estimated Cost (CAD)
Infill and Extension Drilling at Buckton South and Asphalt (4,000 m)	$4,000,000
Soil Sampling Program-South SBH	$200,000
Creek Mapping and Rock Sampling Program-South SBH	$50,000
Metallurgical Test Work	$125,000
Mineral Resource Estimation and Technical Report	$150,000
Phase 1 Subtotal	$4,525,000
Contingency (~7.5%)	$340,000
Phase 1 Total	$4,865,000

Phase 2 Technical Program	
Activity	Estimated Cost (CAD)
Infill drilling at Buckton South and Asphalt (5,000 m)	$5,000,000
Metallurgical Test Work, Leaching Test Work, and Bulk Sampling	$500,000
Geotechnical, Hydrological, Environmental Studies	$500,000
Preliminary Economic Assessment and Technical Report	$300,000
Phase 2 Subtotal	$6,300,000
Contingency (~7.5%)	$470,000
Phase 2 Total	$6,770,000
Phase 1 and Phase 2 Total	$11,635,000

Source: APEX (2025)

2 Introduction

2.1 Issuer and Purpose

This Technical Report (the "Report") on the SBH Property (the "Property") was prepared by APEX Geoscience Ltd. ("APEX") at the request of the Issuer, Critical Minerals Americas Inc. ("CMAI" or "the Company"). CMAI is a private Canadian company incorporated to advance development of discoveries previously made on its SBH Property of long-term domestic supplies of critical minerals, metals, REEs (rare earth elements) and lithium-scandium (Li-Sc). CMAI holds 100 per cent (%) interest in nine (9) contiguous Alberta rock-hosted minerals permits collectively comprising an aggregate of 46,666 hectares (ha) known as the SBH Property (the "Property"). The Property is located over the eastern erosional edge of the Birch Mountains, Athabasca Region, in Northeast Alberta, Canada (Figure 2.1).

This Report details the historical work and developments of historical Mineral Resources, Mineralized Zones, and conceptual exploration targets discovered within the Property boundaries to date. The intent and purpose of this Report is to provide a technical summary of available geological, geophysical and geochemical information, and to summarize the exploration status of the SBH Property which CMAI recently acquired in order to re-activate the exploration and advancement of this critical metal and mineral enriched black shale Project.

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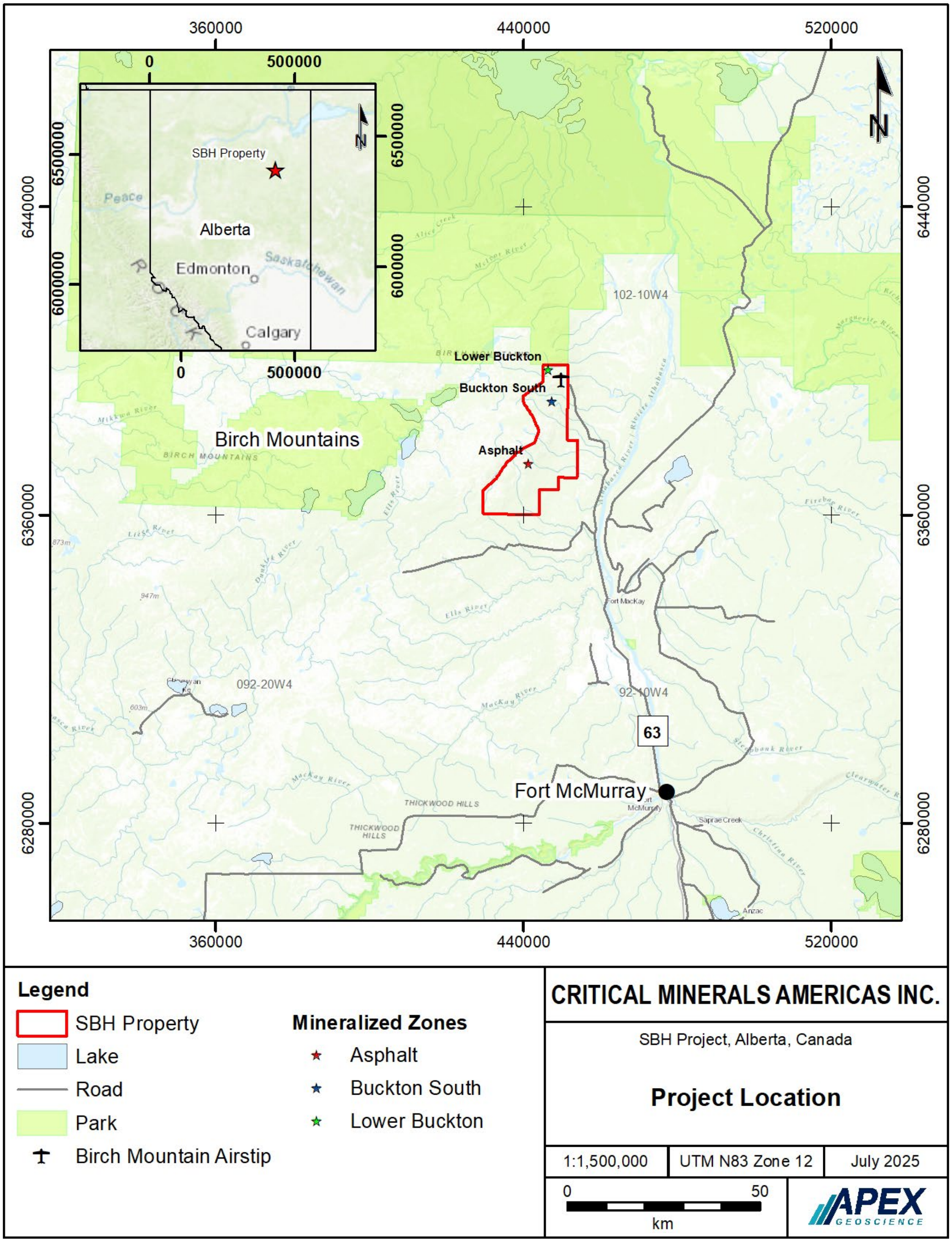
Both Mr. Dufresne and Mr. Eccles have had prior involvement with the Property, while under the ownership of Tintina Mines Ltd. (Tintina) in the 1990's and subsequently DNI. Previous involvement included site visits, and historical mineral resource estimates (MREs) that were reported in previous reports (Dufresne et al., 2011; Eccles et al., 2012a; Eccles et al., 2012b; Eccles et al., 2013a; Eccles et al., 2013b; Eccles et al., 2013c and Puritch et al., 2014). They acted on occasion as QPs for several work programs carried out on the Property.

Figure 2.1 General location of the SBH Property.



Mr. Dufresne is a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA; Member #: 48439), a Professional Geoscientist with the Engineers and Geoscientists of British Columbia (EGBC; Member #: 37074), the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG; Member #: L3378), the Association of Professional Engineers & Geoscientists of New Brunswick (APEGNB; Member #: F6534) and the Professional Geoscientists of Ontario (PGO; Member #: 3903), and has worked as a mineral exploration geologist for more than 40 years since his graduation from university. Mr. Dufresne has been involved in all aspects and stages of mineral exploration and mining including mineral resource assessments in North America, Europe and Australia for precious metal, base metal and critical mineral deposits. Mr. Dufresne is directly responsible for Sections 1 to 3, 9 to 14, 23 to 27 of this Report for the SBH Property

Mr. Eccles is a Professional Geologist registered with APEGA (Member #: 74150) and the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL; Member #: 08287) and is a QP as defined in NI 43-101. Mr. Eccles has worked as a geologist for more than 35 years since his graduation from university. Mr. Eccles has been involved in all aspects of mineral exploration, mineral research, and mineral resource estimations for metallic, industrial, and specialty mineral projects and deposits, across Canada, the United States, Europe, Australia, and other international destinations. Mr. Eccles is responsible for Sections 4 to 8 of this Report for the SBH Property.

Recent site visits by Mr. Dufresne to the SBH Property were completed in November 2022, and in September 2023. During the site visit on November 17-18, 2022, Mr. Dufresne observed the Property from a helicopter and confirmed the locations of 9 historical drill pads for 11 drillholes in the Lower Buckton, Buckton South and Asphalt mineralized zones. Mr. Dufresne conducted a second site visit on September 21, 2023, during the CMAI outcrop sampling program and supervised APEX personnel conducting an outcrop trenching and sampling program.

2.3 Sources of Information

This Report is a compilation of publicly available information as listed in the "References" section at the conclusion of this report and is based upon a review of historical information and data from exploration programs conducted in the Property area, as well as information gathered during the author's site inspections. A large portion of the background information for prior exploration and geology comes from work performed on the Property by DNI and Tintina, which are detailed in various publicly available technical and assessment reports by Sabag (1996; 1998;, 1999; 2008; 2010; 2012; 2014), Dufresne et al. (2011), Eccles et al. (2012a; b), Eccles et al. (2013a; b; c) and Puritch et al. (2014).

The technical information discussed in this Report was provided to the Authors by the Company and was verified prior to the completion of this report. The supporting documents used as background information are referenced in the History, Geological Setting and Mineralization, Deposit Types and Reference sections. Mr. Dufresne, the lead author of this Report, has reviewed all government and miscellaneous reports. Mr. Dufresne has deemed that these reports and information, to the best of his knowledge, are valid contributions and where necessary takes responsibility for the ideas and values as they pertain to the current Report.

2.4 Units of Measure

With respect to units of measure, unless otherwise stated, this Report uses:

1) Abbreviated shorthand consistent with the International System of Units (International Bureau of Weights and Measures, 2006);
2) Bulk weight is presented in both United States short tons (tons; 2,000 lbs or 907.2 kg) and metric tonnes (tonnes; 1,000 kg or 2,204.6 lbs.);
3) Geographic coordinates are projected in the Universal Transverse Mercator (UTM) system relative to Zone 12 of the North American Datum (NAD) 1983 ellipsoid, while all previous work was referenced to NAD 27;
4) Currency in Canadian dollars (CAD$), unless otherwise specified (e.g., U.S. dollars, US$);
5) Elevation in metres above sea level (masl);
6) Tonnes-per-annum (tpa) and million-tonnes-per-annum (Mtpa);
7) Specific gravity (SG; kg/m^3); and,
8) Parts per million (ppm).

3 Reliance on Other Experts

The information discussed in Section 4 of this report is based on publicly available and private information provided by CMAI. While the Authors did make reasonable efforts to confirm claim ownership, permitting and environmental status of the Property, the Authors offer no professional opinions regarding the provided information as they are not experts in legal matters, such as the assessment of the legal validity of mining claims and property agreements.

CMAI entered into a purchase agreement with DNI to acquire 100% interest in the SBH Property on September 5, 2022, and title to the Property was legally transferred to CMAI on January 6, 2023; however, no copy of the agreement was provided to the Authors. The Authors confirmed on July 1, 2025, via the Alberta Department of Energy Geoview system (https://gis.energy.gov.ab.ca/Geoview/Metallic), that the SBH Property mineral permits are held by CMAI and are in good standing.

4 Property Description and Location

4.1 Description and Location

The SBH Property is located on the eastern slopes, or erosional edge, of the Birch Mountains of Northeastern Alberta, approximately 120 km North of the city of Fort McMurray, Alberta in the Athabasca oil sands region. CMAI holds a 100% interest in the SBH Property that consists of nine (9) contiguous Alberta rock-hosted mineral permits collectively comprising an aggregate of approximately 46,666 ha (467 square kilometres). The Property sits within National Topographic System Sheets (NTS) 84H and 74E.

To maintain continuity with historical work, historical location names are retained to facilitate referencing of prior work by referring to Buckton, Buckton South and Asphalt Zones by their historical names. One exception to the historical names is a small portion of a 2013 era mineral deposit previously identified as the Buckton Deposit by DNI, which straddles the northern boundary of the current SBH Property. Approximately 12.9% of this historical resource (MRE and PEA) remains on the CMAI property, with 87.1% of the deposit and historical resource now located within a Provincial Park. This portion of the Buckton mineralized zone is now termed the Lower Buckton Zone.

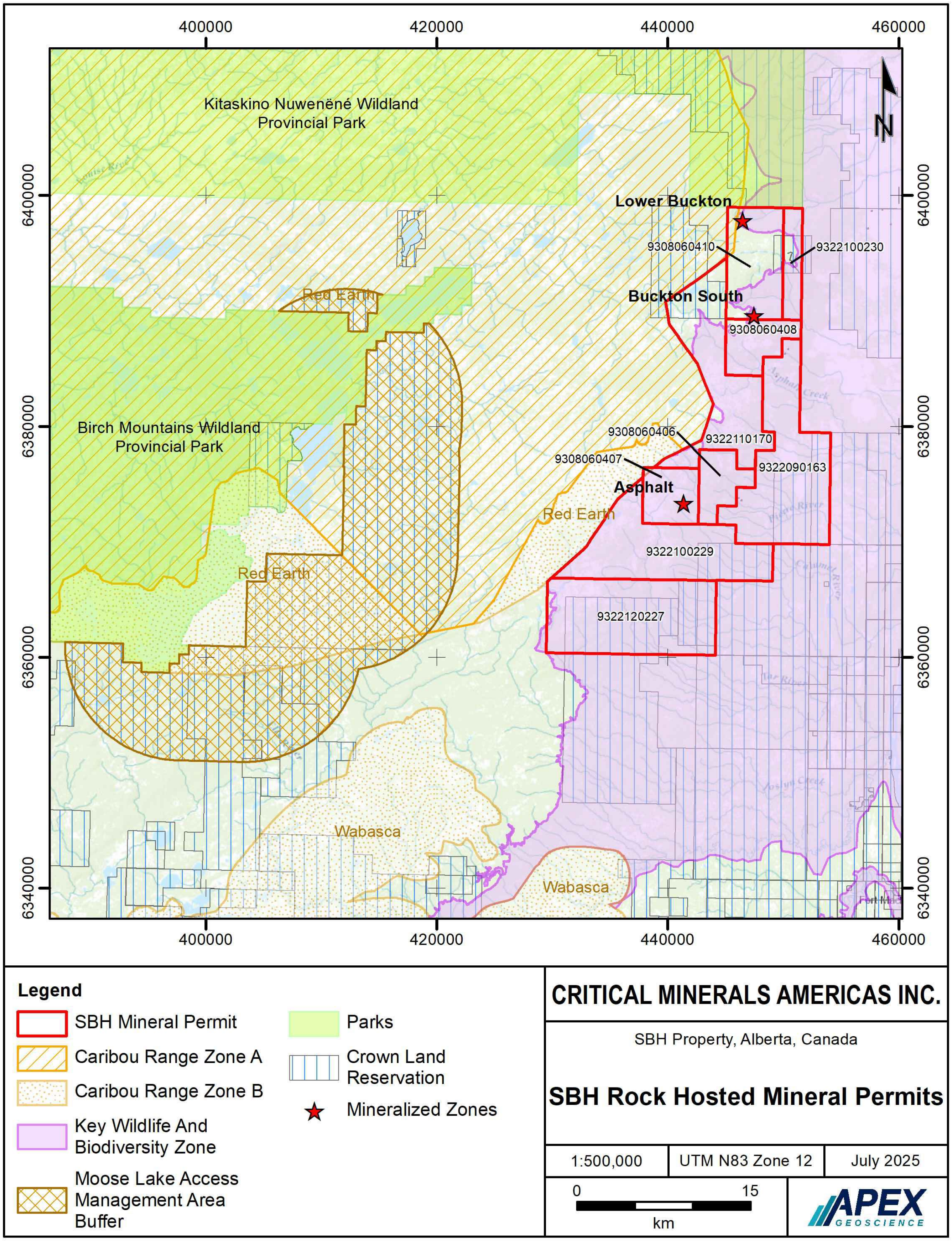
Alberta rock-hosted minerals permits provide the exclusive right to explore the lands for metallic minerals indefinitely as long as the minimum exploration spending requirements are being met. Two-year term work requirements for maintenance of the permits are $7/ha for the first term, $13/ha for each of the second and third terms, and $20/ha thereafter for all subsequent two-year terms with no expiry date. Term dates of the SBH Property rock-hosted mineral permits are listed in Table 4.1.

Table 4.1 Rock-hosted mineral permit descriptions and status for the SBH Property.

Permit Number	Holder	Tenure Type	Term Date	Area (ha)
9308060406	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	6/30/2008	2,048.00
9308060407	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	6/30/2008	2,304.00
9308060408	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	6/30/2008	2,304.00
9308060410	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	6/30/2008	4,608.00
9322090163	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	9/21/2022	9,216.00
9322100230	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	10/17/2022	1,536.00
9322110170	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	11/17/2022	7,267.72
9322120227	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	12/16/2022	9,211.22
9322120229	Critical Minerals Americas Inc.	Rock Hosted Mineral Permit	10/17/2022	8,171.07
			Total (ha)	46,666.01

Source: APEX (2025)

Figure 4.1 Rock-hosted mineral permits and surface restrictions sketch for CMAI's SBH Property.



Alberta rock-hosted minerals leases provide exclusive rights to any minerals discovered on a 15-year renewable term basis. Rock-hosted mineral leases start with a fifteen-year primary term, followed by another fifteen-year intermediate term subjected to escalating rental fees. If a lease is in production, it will be eligible to enter the continued term. The escalating rental fees begin at $3/ha and gradually increase to $40/ha for the final year of the intermediate term.

Rights to explore metallic and industrial minerals, bitumen (oil sands), coal and oil/gas within the region are regulated under separate statutes, which collectively make it possible for several different "rights" to coexist and be held by different grantees over the same geographical location. Coexistence of rights is an artifact of the flat-lying configuration of subsurface geological formations within the region, and the potential of different formations for hosting different resources including oil, gas, coal and minerals.

4.2 Royalties and Agreements

The SBH Property is held 100% by CMAI, and there are no royalties due to any third parties other than the Provincial Mining Royalty due to the Province of Alberta levied against production revenues.

The Alberta Metallic Minerals Royalty is reserved to the Crown and is paid starting within the month of the first sale of products from the mine. The royalty rate is 1% of mine mouth revenue. After payback of the capital investment is completed, the royalty is the greater of 1% of mine-mouth revenue or 12% of net revenue.

4.3 Environmental Liabilities, Permitting and Significant Factors

Non-ground-disturbing activities, such as geophysical surveys, geological mapping, and geochemical sampling that do not involve digging or trenching, do not require a specific permit under the Mines and Minerals Act. Before any ground disturbance work, including drilling, is conducted, an Exploration Licence and Exploration Permit are required. This is a one-time application, and the Exploration Licence and Permit remain in effect for as long as the company is practicing, and the permits have remained in good standing. The Exploration Permit allows the holder to operate exploration equipment within the province. The Exploration Licence allows the holder to submit exploration program for approval. No ground-disturbing exploration activity can be carried out until a Metallic and Mineral Exploration (MME) approval has been issued by the Alberta Energy Regulator (AER) for each program submitted under the licence.

Prior to submitting an MME application, a pre-consultation assessment (PCA) must be obtained from the Aboriginal Consultation Office (ACO). PCA's indicate if and what level of consultation with First Nations and certain Métis groups is required for programs on public lands. All consultation requirements must be met prior to being granted an MME approval.

MME approvals will contain minor activity restrictions based on the surface and land use restrictions of the area. The Alberta Government's Landscape Analysis Tool (LAT) is used to list restrictions in place on a specific Rock-Hosted Mineral Permit.

Most of the Property (Figure 4.1) is designated as the Key Wildlife and Biodiversity Wildlife Zone that is considered to be a combination of key winter ungulate habitat and higher habitat potential for biodiversity. These areas may result in the annual recess of field activities between January 15 and April 30, subject to MME conditions (Government of Alberta, 2015).

Small portions of 9308060410 and 9308060407 overlap with Zones A (High Risk) and B (Low Risk), respectively, of the Red Earth Caribou Range. Woodland caribou are listed as threatened in Schedule 1 of

Canada's Species at Risk Act (since 2003) and are red-listed in Alberta. In 2012, the federal government of Canada called upon provinces and territories to develop and put in place measures to protect woodland caribou, with and aims to establish self-sustaining populations across Canada. As a response, Alberta introduced the Caribou Protection Plan (CPP) in 2013 for limited activities related to mineral exploration. In October 2020, the provincial and federal governments signed the *Agreement for the Conservation and Recovery of the Woodland Caribou in Alberta* under Section 11 of Canada's *Species at Risk Act* (SARA). These agreements aim to stabilize the province's woodland caribou population, by reducing the industrial footprint and impact on the caribou habitat. The submission of the CPP to the AER with the MME application is a pre-requisite for exploration and construction activities within the zones identified. As part of the CPP guidelines, no work can be conducted on the overlapping ground between 15 February to 15 July each year (Government of Alberta, 2012).

Parts of the Property are covered by Alberta crown land reservations (CLR) lands, which are reserved for their potential to land users and serve as a tool to identify management intent. A reservation is not a disposition, does not grant any rights to public land or rights to access or occupy land or rights to the resources on the land or under it. Table 4.2 lists the CLRs overlapping the SBH Property and they are shown in Figure 4.1.

Table 4.2 Crown Land Reservations overlapping the SBH Property

Reservation Number	Purpose	Area (ha)
CLR060001	Land Management	1477.87
CLR120010	Land Management	4469.82
CLR160001	Land Management	7535.29
CLR130020	Wildfire Management	783.64
CLR870013	Oil and Gas Resource Potential	4651.88
CLR150069	Research Sample Plots: Reforestation	1.00
CLR150070	Research Sample Plots: Reforestation	1.00
CLR150081	Research Sample Plots: Reforestation	1.00
CLR150083	Research Sample Plots: Reforestation	1.00
CLR150085	Research Sample Plots: Reforestation	1.00

Source: APEX (2025)

Portions of the Property fall partially or completely within a Historic Resource Value (HRV) of 4, which require a Historical Resources Act approval. HRV's are based on the presence of a known historic resource or the potential to contain one. When the submission of a Historic Resources Application is triggered for only a portion of an area, the entire Project area becomes subject to review and must be included in the application. An HRV of 4 indicates a historic resource that may require avoidance or assessment. Historic Resources may fall into categories such as archaeological, cultural, geological, historic period, natural or palaeontological.

The Authors are not aware of any environmental liabilities to which the Property may be subject to. The Authors understand that CMAI has yet to perform any ground disturbance work and to the Authors knowledge, there is no significant historical work which would result in any environmental liabilities on the Property.

The Authors are not aware of any other significant factors or risks, other than those mentioned above, that would affect access, title, or the ability to perform work on the Property.

5 Accessibility, Climate, Local Resources, Infrastructure, and Physiography

5.1 Accessibility

The SBH Property is directly accessible by winter roads and air (fixed-wing and helicopter) from the city of Fort McMurray, Alberta, located about 120 km to the South of the Property. Fort McMurray is approximately 450 km by road North of Edmonton and is served by regular daily commercial flights from Edmonton, Calgary, Toronto and other communities. Many people regularly commute to and from oil sands properties from these places. Principal access is by road, although discussions emerge from time to time to recommission the CN rail service which currently offers freight railhead just to the south of Fort McMurray. Access to the Property is illustrated in Figure 5.1.

The Athabasca and the Clearwater Rivers represent the two principal waterways in the region, with countless other streams and smaller rivers draining into them. Most of the streams are characterized by jagged shapes consisting of many relatively straight water courses, reflecting in most parts underlying faults and joint systems. The Athabasca River, which flows north into Lake Athabasca, bisects the region and provides relatively good water access across most of the region.

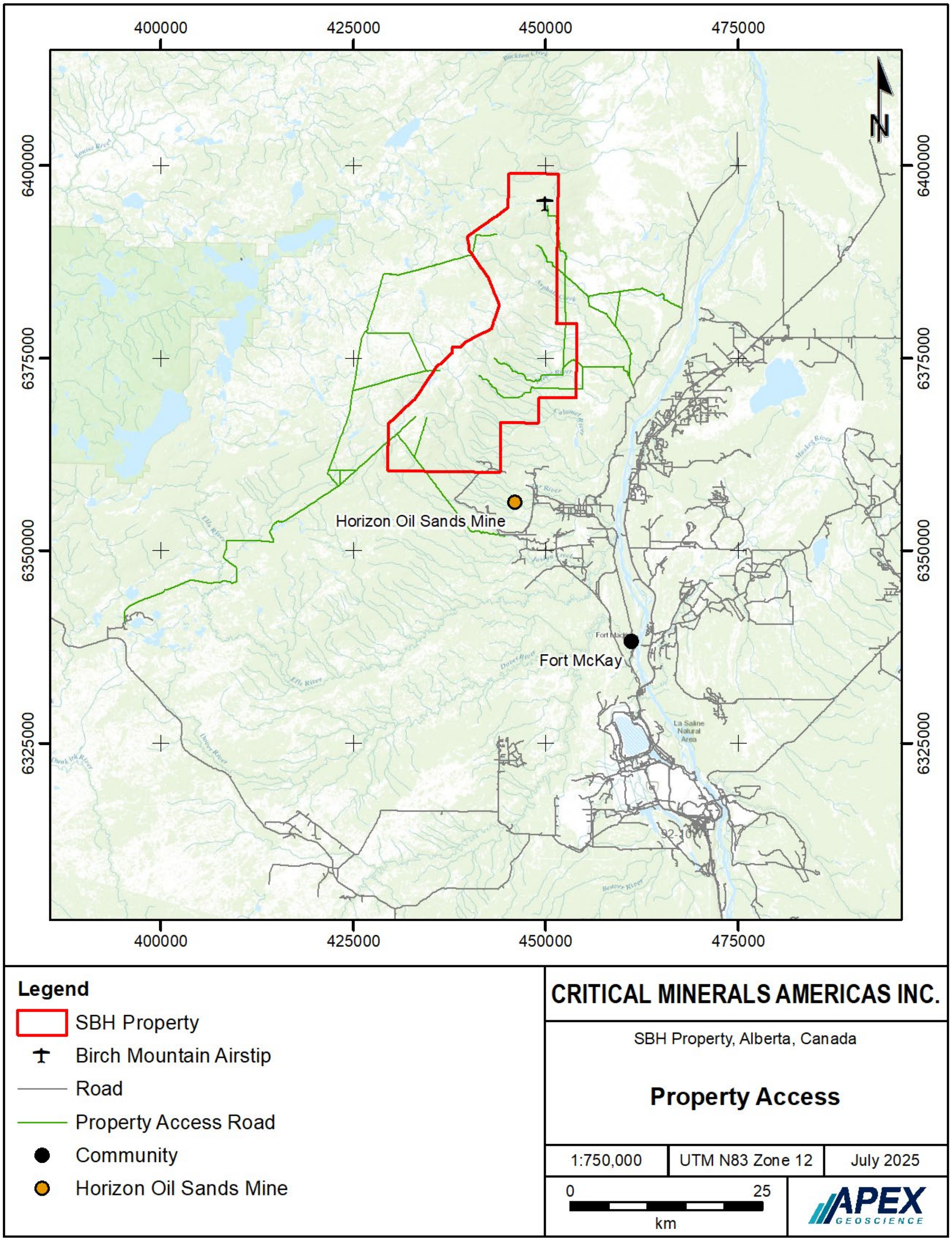
Access to areas throughout the region is relatively good, facilitated by a network of highways, secondary roads and old seismic lines, which also serve as winter roads and bush roads and in some cases are also accessible in summer by all-terrain vehicles. Past exploration activities have occasionally gained access to the west shore of the Athabasca River by ice-bridges constructed from an area near Bitumont, as a joint effort between forestry harvesting and mineral exploration companies. Future programs will, however, benefit from the considerable amount of road construction currently in progress to support the numerous oil sand operations, which are in various stages of development. One nearby oil sand operation, Horizon, has been in operation since 2009.

The Birch Mountains have traditionally been accessed in the summer months by barge/boat via the Athabasca River. Although the principal modes of access have been by rotary aircraft or by fixed wing aircraft landing on the half mile long Birch Mountain Airstrip which also houses a seasonally manned Fire Tower and telecommunications relay station. The Birch Mountain Airstrip, managed by Alberta Sustainable Resource Development Forest Protection Division, is located within the northeastern portion of the SBH Property. There are other private airstrips throughout the region, the nearest being Shell Canada's Pierre River Property, and Canadian Natural Resources Limited's (CNRL) Horizon oil sands Property located to the south of the Property. Winter access is via the Birch Mountain Winter Road which passes northerly from the village of Fort MacKay and is better negotiated after freeze-up as it crosses several streams and over wet muskeg. The Horizon Road splays from the foregoing partway and provides the principal all weather access to CNRL's Horizon oil sands mine. Many other winter roads, under road allowance agreements to oil sands companies exploring the Birch Mountains, provide good north-south access across much of the bottom three quarters of the Property. The Asphalt area has been road-accessible on previous winter exploration programs.

5.2 Site Topography, Elevation and Vegetation

Physiography over the general region around Fort McMurray is variable and is characterized by low, often swampy, relief punctuated by a handful of features protruding above the otherwise flat terrain. The Birch Mountains are one of the most conspicuous topographic features in the region between Fort McMurray and

Figure 5.1 Access to the SBH Property.



Wood Buffalo National Park. The Property covers the eastern erosional edge of the Birch Mountains and gradually wraps southwestwards around that edge.

By far, the greatest topographic relief in the region are the Birch Mountains (elevation 750 to 820 masl), that protrude conspicuously some 500 to 600 m above the surrounding areas (250 masl), with a distinct erosional edge. The Birch Mountains are characterized by many river and creek incisions into poorly consolidated stratigraphy susceptible to active landslides and slumps. River valley incisions in the area are progressively deeper as they get near the erosional edges of the Birch Mountains and the drainage in the area defines an approximate radial pattern outward from the Birch Mountains. Localized radial drainages are also present within the Birch Mountains area, characterized by creeks flowing outward from what appear to be 1 to 2 km diameter circular domes.

The SBH Property overlies the Upper and Lower Boreal Highland Natural Subregions of the larger Boreal Forest Natural Region, as defined by Downing and Pettapiece (2006). The Lower Boreal Highland sub-region, below about 825 masl, is characterized by mixed coniferous-deciduous forest containing poplar, spruce, birch and pine trees. The Upper Boreal Highlands (above 825 masl) is characterized by predominantly coniferous forests (mainly pine and spruce) with minor, generally poorly developed, aspen and birch trees. In both the Upper and Lower Boreal Highlands, forest understories include shrubs and feather mosses, and both sub-regions commonly contain poorly drained wetlands consisting of small shallow lakes (generally less than one kilometre across and less than two metres deep), and bogs hosting spruce trees, shrubs and mosses.

5.3 Climate

Northeast Alberta weather is somewhat cooler than Canadian central provinces. Winter temperatures are cold, averaging -20 degrees Celsius (°C) (minimum -40°C), and summers are warm, averaging 17°C (maximum 30°C) and are typically short (June to August), much like northern Canada. Average annual precipitation for Fort McMurray is approximately 460 millimetres (mm). The Birch Mountains, by virtue of elevation, are somewhat cooler than rest of the region, and are susceptible to fog during long periods of wet weather.

5.4 Local Resources and Infrastructure

Fort McMurray services all oil sands operations in the region and as such, is a thriving town which is well supplied. It offers all support services necessary to exploration work in the area, including expediting, fixed and rotary air support, communications, medical and equipment supplies. Radio as well as telephone communications are also excellent throughout the region. Cellular telephone coverage is good throughout the region, with reception to localities as far away as the Birch Mountains Department of Forestry air strip and fire tower.

Currently, exploration on the SBH Property is possible year-round, except during the ungulate migration period which relates to approximately the western three-quarters of the Property (see Section 4.3).

The closest electrical and natural gas infrastructure to the Property is located at CNRL's Horizon mine, approximately 45 km to the southeast. A 240Kv transmission line and substation from the Alberta Electric System Operator (AESO) is located near the Horizon mine site for future electrical power requirements

Surface water is abundant in the Birch Mountains region. The Athabasca River is the most preferable source of fresh water due to its size, flow consistency and proximity to the Property area.

The Property can be accessed year-round. Most exploration activities associated with fieldwork and drilling can most likely be conducted year-round, although there may be periods from December to March, where snow conditions and temperatures may temporarily impede access to the Property. Sufficient water for exploration is available via local water sources. The surface rights are Provincial Government ownership and First Nations oversight.

In the opinion of the Authors, the Property is of sufficient size to accommodate potential exploration and mining facilities including processing infrastructure. There are no other significant factors or risks that the Authors are aware of that would affect access or the ability to perform work on the Property, bearing in mind the restrictions related to the aforementioned Key Wildlife and Biodiversity Wildlife Zone.

6 History

6.1 Historical Exploration and Development Work

Although the commercial production of oil from the Athabasca oil sands began in 1967, exploration in the area started as early as the late 19th century. In 1882, Dr. Robert Bell of Geological Survey of Canada (GSC) was first to recognize the potential of valuable petroleum resources in the area. The beginning of modern-day commercial oil sands development began in 1953, when the Great Canadian Oil Sands consortium (predecessor of Suncor Inc.) was formed. Construction of the Great Canadian Oil sands plant began in 1964, and production of oil began in 1967. There has been historical gas exploration work in the area by other companies in marine sedimentary formations much deeper beneath the targeted SBH black shales, as recent work over the Birch Mountains area for oil sands buried a few hundred meters beneath the metal rich black shale units. The amount of oil exploration done in the area in terms of oil and gas drilling, or oil sand drilling and mining has provided CMAI useful stratigraphic information for regional geological modelling purposes.

Polymetallic mineralization potential of the Upper Cretaceous black shale units of the Labiche, Second White Specks and Shaftesbury formations in the Birch Mountains was investigated by a number of mining companies since the 1990's. The Property and surrounding areas were actively explored by Tintina Mines Ltd (Tintina) from 1993-1999, and subsequently by Dumont Nickel Inc. (Dumont) and DNI Metals Inc. (name changed from Dumont to DNI Metals Inc. and then DNI) from 2007-2014, respectively.

The following sub-sections related to historical work completed by Tintina, Dumont and DNI are largely modified from or wholly taken from prior assessment and technical reports. These reports are mostly available to the public through government assessment reports and Sedar listed technical reports (Sabag 1996; 1998; 1999; 2008; 2010; 2012; 2014; Dufresne et al., 2011; Eccles et al., 2012a; b; Eccles et al., 2013a; b; c; Puritch et al., 2014). The Authors have reviewed these sources and take responsibility for the information herein.

6.1.1 Tintina Mines Limited Exploration (1993-1999)

The majority of this section has been taken from various publicly available assessment and technical reports prepared by Sabag (1996; 1998; 1999). The Authors have reviewed these sources and take responsibility for the information herein.

In 1993, Tintina acquired the mineral rights for the permits covering most of the north half of the current SBH Property. Tintina carried out three exploration programs for precious metals in 1993 and 1994. Historical prospects were aggressively explored during the period 1993-1999 by Tintina as part of its programs over a 3-million-acre land position it then held across northeast Alberta over approximately 135 townships. Tintina's exploration programs were active until late 1999 and comprised of multi-phased, multifaceted mineral exploration campaigns straddling several years focusing entirely on precious-base metals and uranium rather than REEs and specialty metals.

Tintina collected several thousand multimedia samples in addition to conducting diamond drilling (DDH) programs and consolidating considerable other information from various studies, surveys and other test work completed on its behalf by various professional geoscientists and consulting groups, and from collaborative work with the Alberta Geological Survey (AGS) and the Geological Survey of Canada (GSC).

Tintina initially discovered the metal bearing black shale units by accident in 1995 while searching for metal bearing permeability traps in redox fronts across northeast Alberta. Tintina started its regional work program in 1993, focusing on the Cretaceous-Devonian unconformity, but its polymetallic metals discoveries it made in the Birch Mountains in 1995 shifted focus of its initial work program to the exploration potential of the black shales as prospective redox fronts which could act as trap sites and accumulate considerable metals at their base. Intrinsic potential of the black shales as hosts to polymetallic metals was not recognized until after completing the 1997 drilling campaign. This drilling campaign, originally aimed at probing beneath the black shales, discovered metal enrichment within the black shales themselves. What started out in 1993 as a search for carbonate hosted gold-copper bearing redox systems similar to roll-front uranium deposits, ultimately led over a four-year period to the discovery of a metalliferous black shale assemblage at the Lower-Upper Cretaceous unconformity associated with considerable subaerial venting (in the form of altered ash) and previously unknown extinction markers (fish and bone bed marker horizons).

Tintina's work, often supported by the AGS and GSC, spanned the full spectrum of exploration activities as shown in Table 6.1. Results from all of these work programs are collated in a series of Alberta Mineral Assessment Reports (Sabag, 1996; 1998; 1999).

Table 6.1 Summary of Tintina's Previous Exploration Activities SBH Property Area.

Company	Year	Total DDH	Total Drilling (m)	DDH on SBH	Total Drilling on SBH Property (m)	Exploration and Development Activities
Tintina Mines Ltd	1993					Tintina acquires Property.
	1994					Remote imagery analysis, air photo imagery analysis, lake sediment/water geochemical sampling, stream sediment geochemical and heavy concentrate sampling, and lithogeochemical reconnaissance sampling
	1994 - 1995					Follow-up heavy mineral concentration test work
	1995					Lake sediment/water geochemical infill sampling, stream sediment geochemical sampling, heavy metal concentrate infill sampling, lithogeochemical reconnaissance sampling, soil geochemical sampling, and stratigraphic compilation and modeling
	1996					Follow-up soil geochemical sampling
	1996 - 1997	8	915.73	3	298.75	Buckton and Asphalt winter drilling programs
	1997					High resolution aeromagnetic survey
	1997 - 1998					Preliminary flotation, leaching, and sequential/selective leaching tests
	1998					Diamond indicator resampling and analyses
	1998 - 1999					Check assaying program

Source: APEX (2025)

The majority of the 1994 work program was aimed at evaluating the regional land position to support the delineation of enriched polymetallic mineralization areas of primary interest. The 1994 work program was successful in identifying several metal enrichment zones within the region and interpreted geochemical patterns enabling the delineation of distinct prospective localities. In contrast to the 1994 work, the 1995 exploration programs included a larger component of geological mapping and lithogeochemical reconnaissance sampling, focusing on the permits located in the Birch Mountains area. Till sampling was also conducted by the AGS over the Birch Mountains area which was supported by Tintina.

Considerable efforts were directed during 1994 as well as 1995 toward the preparation of the necessary geoscientific base maps for the region, and the standardization of nomenclature to enable compilation of often incomplete and disparate descriptive geology as available at the time from publicly available provincial records. Efforts were also devoted to the development of exploration and sampling procedures for the region by way of conducting numerous orientation surveys.

Concurrently with Tintina's efforts, the AGS and the GSC also completed sampling and mapping programs over the Birch Mountains, and over northeastern Alberta, to characterize bedrock and till. Some of the work by the AGS focused on expanding upon Tintina's discoveries of metal enriched Cretaceous black shales as it may apply to Cretaceous shales located elsewhere in Alberta (Dufresne et al., 2001).

The 1996-1997 exploration program focused on certain geochemical anomalies at the Asphalt (Ni-Cu) and Buckton zones (Zn). All field work was carried out on behalf of Tintina by a mix of Tintina and APEX personnel under Tintina's direction. The work consisted of detailed soil sampling over two zones. The soil sampling grids were located at previously identified anomalous nickel-copper (Ni-Cu) zone in soils at the Buckton Zone and an anomalous zinc (Zn) zone at the Asphalt Zone respectively (Figure 6.1). Many of the metallic anomalies identified were interpreted as being derived from the diffusion of trace metals from mineralized primary source rocks at their intersection with faults. Drill targets were selected at the Asphalt and Buckton zones based on results of the soil sampling surveys with the intention of testing the polymetallic mineralization potential of the Second White Specks and Shaftesbury formations. A total of 749.63 m were drilled in six vertical holes at the Buckton Zone, and 166.10 m were drilled in two vertical holes at the Asphalt Zone (Figure 6.2). Anomalous gold (Au), antimony (Sb), Zn, vanadium (V), silver (Ag), strontium (Sr), barium (Ba), calcium (Ca), phosphorus (P) and selenium (Se) were encountered in the Second White Specks Formation. Drill core samples were also subjected to heavy mineral concentrate analysis which identified the presence of several kimberlite indicator mineral grains (e.g. kimberlitic pyrope garnet). Core logging of the 1996-1997 drilling program identified a large number of bentonite (volcanic ash) layers indicating that the deposition of the Second White Specks Formation coincided with an increase in regional volcanic activity. In addition, the amount and size of metallic anomalies within certain distinct localities within the Property area suggests that the presence of anomalous metals are not an overall characteristic of Second White Specks Formation, but rather related to more local events, which further supports speculation of metal input related to potential volcanic centers and/or possible associated hydrothermal vents located on the seafloor.

Following the results of the drilling program, an airborne magnetic survey was commissioned by Tintina over the two properties in 1997. The aim was to better define the locations of certain prospective structures and volcanic centers associated with the previously discovered metal enriched black shale horizons. The airborne magnetic survey identified several small near-circular or "closed" magnetic anomalies underlying the mineralized or geochemically anomalous portions at both the Asphalt and Buckton areas.

The 1997-1999 exploration program at Asphalt and Buckton focused primarily on the investigation of metallurgical test work to determine the recovery rates of the metals and enable the formulation of a preliminary process flowsheet design for extraction of the base metals from the mineralized black shales. This work entailed the completion of selective bench-scale bioleaching test work during 1997-1998, followed by broader flotation tests during 1998-1999. A summary of the bioleaching test work is provided in Section 6.3 of this Report.

Figure 6.1 Historical soil sampling results for Ni (ppb) at the SBH Property

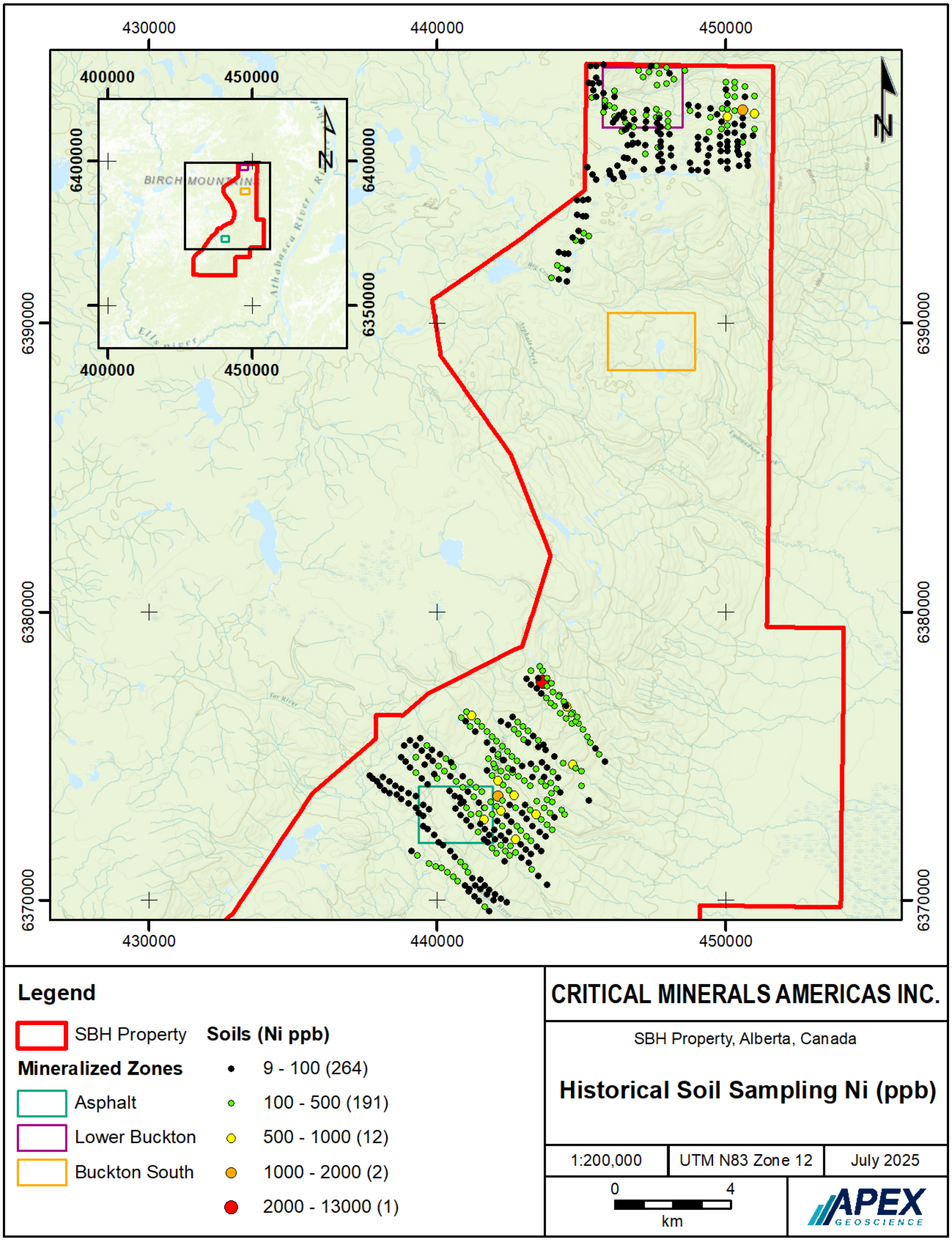
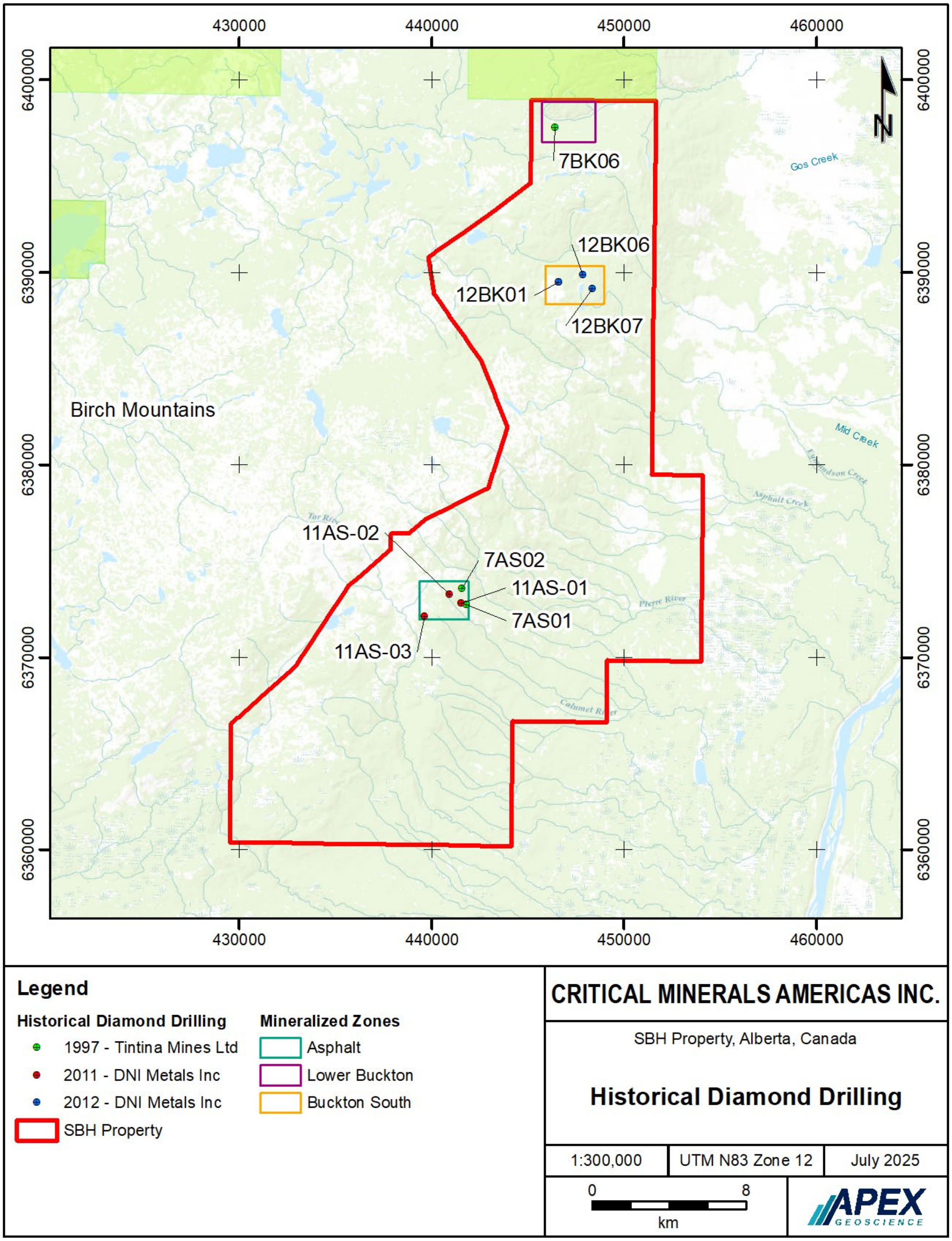


Figure 6.2 Historical diamond drilling collar locations at the SBH Property.



6.1.1.1 Tintina Diamond Exploration Program

Concurrent to the black shales exploration program, Tintina also carried out limited exploration work to evaluate the kimberlite / diamond potential of the area due to kimberlite pipe discoveries located west of the Property. In this regard, APEX was mandated to review and re-interpret the 1997 aeromagnetic data from the Asphalt and Buckton areas as well as re-log and re-examine drill core samples collected (archived) to identify and analyze samples for the presence of kimberlitic indicator minerals.

The results of this work indicated that several of the aeromagnetic anomalies could well be indicative of near-surface kimberlitic intrusions or related volcanics. Kimberlitic indicator minerals were also identified and picked from thin bedded bentonitic sections within the drill core, indicating that the bentonitic section may be derived from distal kimberlite pipes within the Birch Mountains area.

Although follow-up work was recommended, no subsequent diamond exploration work has since been completed at the Property.

6.1.2 Dumont Nickel Inc./DNI Metals Inc. Exploration

Technological advances made in the mid 2000's in industrial scale application of bioleaching for low grade polymetallic metals from black shale mineralized material offered new opportunities for the recovery and beneficiation of metals-rich black shale deposits worldwide as a potential source for developing long-term mineable black shale deposits containing base metals, U, REEs lithium and scandium.

DNI's initial focus, concerned itself mainly with the Second White Specks Formation metal enriched black shale, as had previously been Tintina's focus, but broadened the scope of its exploration work in 2012 to also focus on the overlying Labiche Formation shale as a host to anomalous metals, REEs-Li-Sc mineralization. Only near the end of the multi-year program did DNI expand its mandate to include work on the underlying Shaftesbury Formation unit.

The following section details historical work completed by DNI and has been taken from various publicly available assessment and technical reports prepared by Sabag (2008; 2010; 2012; 2014). The Author has reviewed these sources and takes responsibility for the information herein.

6.1.2.1 Dumont Nickel Inc./DNI Metals Inc. (2007-2010)

Exploration work conducted on the Property by Dumont Nickel consisted mostly of regional and property-scale geoscientific reviews and data consolidation that broadened into analytical work and eventually led to the preparation of a 2008 NI 43-101 technical report (Sabag, 2008). Reanalysis of all the 1997 Tintina drill core samples from the Buckton and Asphalt zones archived in Edmonton, as well as archived samples in storage at the Mineral and Core Research Facility in Edmonton were collected via sampling split drill core to assess metal recoveries from the various black shale units. Samples were collected from a total of eight (8) drillholes. A select handful of drill core samples from the Upper Shaftesbury Formation were also collected, as well as a drill core sample over a long intercept of Labiche Formation black shale material.

A detailed report of Dumont's exploration and development work for the period 2007-2010 was filed in Alberta Mineral Assessment Report MIN20100017 in 2010 (Sabag, 2010). A summary of this work is found in Table 6.2, along with all subsequent work completed by DNI during 2012 to 2014.

Table 6.2 Summary of historical exploration and development work by Dumont Nickel Inc/DNI Metals Inc. on the SBH Property, 2007 to 2014.

Year	Total Diamond Drillholes	Total Drilling (m)	Total Diamond Drillholes on SBH Property	Total Drilling on SBH Property (m)	Exploration and Development Activities
2007					Acquisition of Property by Dumont
2007 - 2008					Data synthesis and comparison of historical materials
2008					Review and inventory of drill core, consolidation of historical data, and technical report preparation
2008-2009					Review, cataloging, and resampling of historical drill core
2009					Verifying results, resampling of historical drill core archive, field sampling program, and leaching and mineral test work
2008-2010					Expansion of subsurface geological database and related stratigraphic modelling
2009-2010					Mineralogy study, bioleaching study, and CO_2 sequestration study
2010					Sulphuric acid leaching test work, field sampling, and related analytical work
2010-2011	8	647.52	3	190.02	Asphalt and Buckton winter drill program and continued bioleaching test work
2011					Resource study on Buckton
2010-2012					Analysis from 2010 core samples, bioleaching and analytical results from previously omitted samples.
2011-2012					Follow up bioleaching test work on 2WS and overburden, leaching test work to evaluate CO_2 as leaching solvent
2012	9	983.77	5	297.77	Summer drill program on Buckton and Buckton South, resource study, bioleaching test work, and resampling of '97 Labiche Formation core
2013					Resource study for Buckton and Buckton South and preliminary economic assessment (PEA) of Buckton
2012-2014					Bioleaching/Leaching test work, economic assessment on Buckton, preliminary works evaluating Pelican Formation as frac sand, PEA of river hydro
2014					Reconnaissance frac sands sampling program

Source: APEX (2025)

Detailed inspection of the historical Tintina drill core noted growth of sulphates over some of the Second White Specks Formation shale footages as well as some measure of auto-oxidation, indicating that portions of the available drill core might not be suitable as sample material to carry out the metals leaching and bioleaching test work planned. Given this uncertainty, a decision was made to also conduct leaching test work on "fresh" drill core samples representative of its polymetallic black shale zones. A field sampling program was conducted over select portions of the Property in 2009, to collect fresh representative black shale sample material for analytical and metallurgical programs. Additional field sampling was completed in 2010 to collect black shale material for expanded metal leaching test work. A total of 48 samples were collected during the 2009 and 2010 rock sampling programs (Figure 6.3). Historical metallurgical test work studies are summarized below in Section 6.3.

6.1.2.2 DNI Metals Inc. (2010-2012) (formerly Dumont Nickel Inc.)

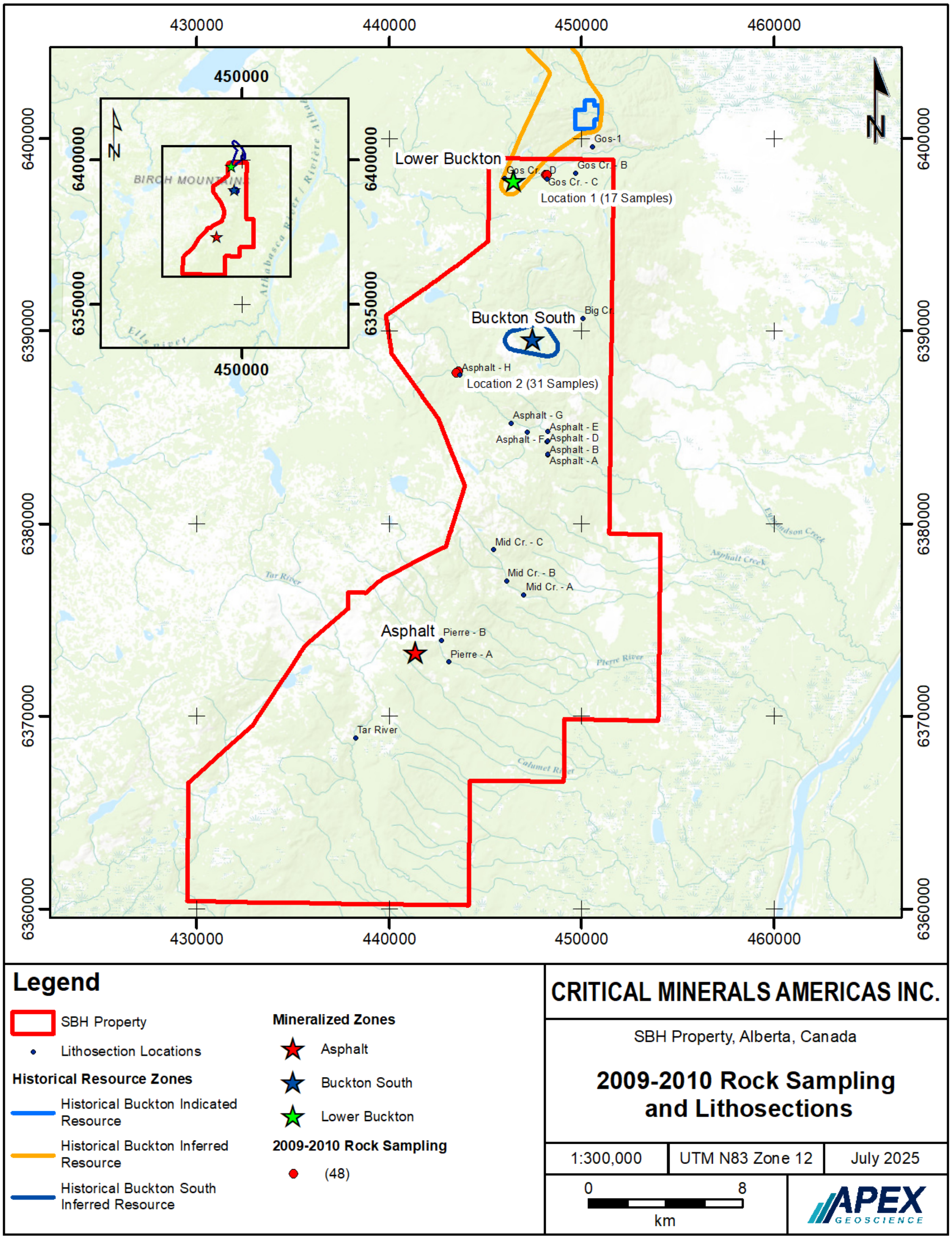
Dumont changed its name to DNI Metals Inc. (DNI) in 2010. Exploration conducted on the Property by DNI between 2010 and 2012 consisted of a diamond drilling program and the preparation of three historical mineral resource studies from the Buckton Zone (Dufresne et al., 2011; Eccles et al., 2012a; Eccles et al., 2012b; see Section 6.2). Other activities leading up to the preparation of the mineral resource studies consisted of permitting and community consultation, and on-going leaching test work to establish hydrometallurgical methodologies and subsequent metals recoveries from both the Second White Specks and Labiche Formations (see Section 6.3). A detailed report of DNI's work for the period 2010 to 2012 was filed in Alberta Mineral Assessment Report MIN20120007 in 2012 (Sabag, 2012). A summary of this work is presented above in Table 6.2.

A diamond drilling program was completed by DNI during the 2010-2011 winter season over the Buckton and Asphalt zones (Figure 6.1) with the objective of completing enough drillholes to enable the delineation of the historical maiden mineral resources over the two zones. A total of eight (8) HQ diameter vertical holes were drilled in 2011 totalling 648 m to test sections of the Asphalt and Buckton zones.

All, except one of the eight holes drilled, successfully intersected the Second White Specks Formation shale unit with reported drillhole intercepts ranging from 11.1 to 22.0 m in thickness. Five of the eight holes drilled outlined an area approximately 3 square kilometres in size within the Buckton Zone area which was the focus area for the maiden historical mineral resource estimate. The first historical mineral resource study was completed by APEX Geoscience in October 2011 (Dufresne et al., 2011; see Section 6.2).

Three vertical drillholes were drilled at the Asphalt Zone with two of the drillholes confirming the presence of Labiche, Second White Specks and Shaftesbury Formation shale below the surface. The drilling program over the Asphalt Zone confirmed the occurrence, geological continuity, presence of metallic and REE mineralization and grades for each of the black shale units identified to the north at Buckton and Buckton South. Due to the paucity of drillholes at Asphalt, a mineral resource estimate was not carried out for the Asphalt Zone.

Figure 6.3 2009 and 2010 Dumont rock sampling locations for expanded metal leaching test work and litho-section locations.



Dumont's principal focus during 2007-2010 was on evaluating and determining the Mo-Ni-U-V-Zn-Cu-Co-Li potential of the Property. However, DNI's 2010-2012 work programs recognized the significance of Specialty Metals (e.g.: Li, Sc, Th) and REEs contained in the black shales in low concentrations but as recoverable co-products as demonstrated by the previous results obtained from the bioleaching test work programmes completed.

DNI launched a series of bioleaching research and development programmes from 2010 to 2012 relying on prior tests conducted by the BRGM in 2010. In 2011, a series of bioleaching tests were initiated to test amenability of metal extraction from composite fresh drill core samples collected from DNI's winter drilling program at Alberta Innovates Technology Futures (AITF - formerly the Alberta Research Council). The 2011-2012 bioleaching tests focused on recovering only Mo-Ni-U-V-Zn-Cu-Co-Li and, as such, AITF's final report outlines results only for the foregoing metals, even though the underlying multielement analytical results from the various fractions of the leaching also provide results for a range of other metals that were of interest to DNI including the Specialty Metals Sc-Th as well as REEs (Budwill, 2012a; b).

The discovery of anomalous REEs and Special Metals mineralization within the black shale units on the Property led to the reanalysis of all available drill core from the Buckton Zone. This work involved complete REE assaying of all intercepts of the Second White Specks Formation shale from DNI's 2010-2011 drilling program and material collected by DNI from archived historical 1997 Tintina drill core during its 2009 verification sampling program.

A sample of Labiche Formation black shale overlying the Second White Specks Formation was used during all of DNI's test work programs as a matrix-matched analytical blank since it is also a black shale but is substantially devoid of base metals. Overburden cover rocks (e.g., Labiche Formation shale) overlying the historical Buckton inferred mineral resource were considered to be "waste" material for the purposes of estimating the Buckton resource. However, results of the bioleaching tests indicated that the Labiche Formation black shale may have some economic potential given that the contained metals and REEs, even though in low concentrations than the Second White Specks Formation black shale unit, were deemed recoverable from the test work.

Details of the historical bioleaching test work are presented in Section 6.3 of this Report.

6.1.2.3 DNI Metals Inc. (2012-2014)

A detailed report of DNI's work for the period 2012-2014 was filed in Alberta Mineral Assessment Report MIN20140008 in 2014 outlining considerable work completed by DNI during the period 2010-2012 (Sabag, 2014). A summary of this work is provided above in Table 6.2, with historical mineral resources and historical metallurgical studies summarized in Section 6.2 and 6.3, respectively.

Dumont's 2009 re-sampling and re-analysis of the 1997 historical Tintina drill core provided an extensive multielement lithogeochemical database for the Second White Specks Formation black shale; however, historical analytical databases for the Labiche Formation overlying it, and the Shaftesbury Formation beneath it, lacked data for some of the REEs and specialty metals. The historical Tintina drill core was re-sampled during 2012 by chip sampling over the entire length of the Labiche and Shaftesbury drill intercepts.

As discussed in the previous section, DNI broadened focus of its exploration program at the Property in 2011 based on its bioleaching test work results to also evaluate potential of the Labiche and Shaftesbury formations as host to polymetallic mineralization. DNI also broadened the scope of its focus to include REEs and specialty metals (e.g., Li, Sc, Th) as incidentally recoverable co-products to leaching of base metals and uranium from its target black shales (see Section 6.3).

A diamond drilling program was completed by DNI during the summer of 2012 over the Buckton and Buckton South Zones (Figure 6.1) with the minimum objective of completing a sufficient number of drillholes to enable the drill testing confirmation of the Buckton Zone and Buckton South Zone for delineate an initial mineral resource, and to exploring northward the projected extension of the Buckton Zone with a view to expanding the Buckton historical initial inferred mineral resource.

A total of nine HQ diameter vertical holes were drilled during 2012, totalling 984 m, to test sections of the Buckton and Buckton South polymetallic Mineralized Zones. All of the holes drilled, except one, 12BK05, successfully intersected the Second White Specks Formation black shale unit which was DNI's principal target hosting polymetallic mineralization. Labiche Formation black shale material was also intersected in all of the nine holes ranging in thicknesses from 16 to 84 m. Three of the drillholes were collared at the Buckton South Zone located eight kilometres to the south of the Buckton Zone's historical MRE and successfully confirmed the presence of this mineralized zone over approximately three-square kilometres.

Six holes were completed over the Buckton Zone to expand the Buckton historical MRE and to also upgrade a portion of the Inferred resource the Indicated category. Three drillholes were completed over the Buckton South Zone to enable the delineation of a historical "maiden" Inferred mineral resource estimate (see Section 6.2).

The 2012 drilling results confirmed that the Cretaceous age black shales at the Buckton and Buckton South zones provide considerable geological and geochemical – grade continuity over large distances of several kilometers across the Property.

From 2012 to 2014, DNI completed additional exploration work to evaluate for other non-metallic assets which the Property hosts that could add future value to the Property. This included initial work to evaluate the potential of the Pelican Formation sandstone unit as a source for natural sand proppant or frac sand for use in the oil and gas industry. The initial work consisted of reconnaissance sampling of two major slope exposures of this formation. This sampling program confirmed the presence of various sand bed sections within this formation containing coarse clean sand of good roundness and sphericity with potential to meet frac sand specifications.

DNI also completed the identification of potential sand/gravel over other parts of the Property, and a preliminary evaluation of the potential for run of river hydro as a seasonal source of power that could provide benefits to any future mining operations on the Property.

DNI commenced evaluating the Pelican Formation as a potential host to natural sand proppant ("frac sand") for use by the oil/gas industry in 2014.

6.1.3 Historical Oil and Gas Drilling

From 1957 to 2021, 317 rotary oil and gas wells for 95,292.2 m were completed within the Property (Figure 10.1). Oil and gas well data was downloaded from the Abadata website. Most of the wells were targeting much deeper formations than the formations of interest for Critical Minerals (Labiche, Second White Specks, and the Shaftesbury). However, many of the logs recorded the overlying metalliferous black shale formations, particularly in the northeast of the Property.

6.2 Historical Mineral Resources at the SBH Property

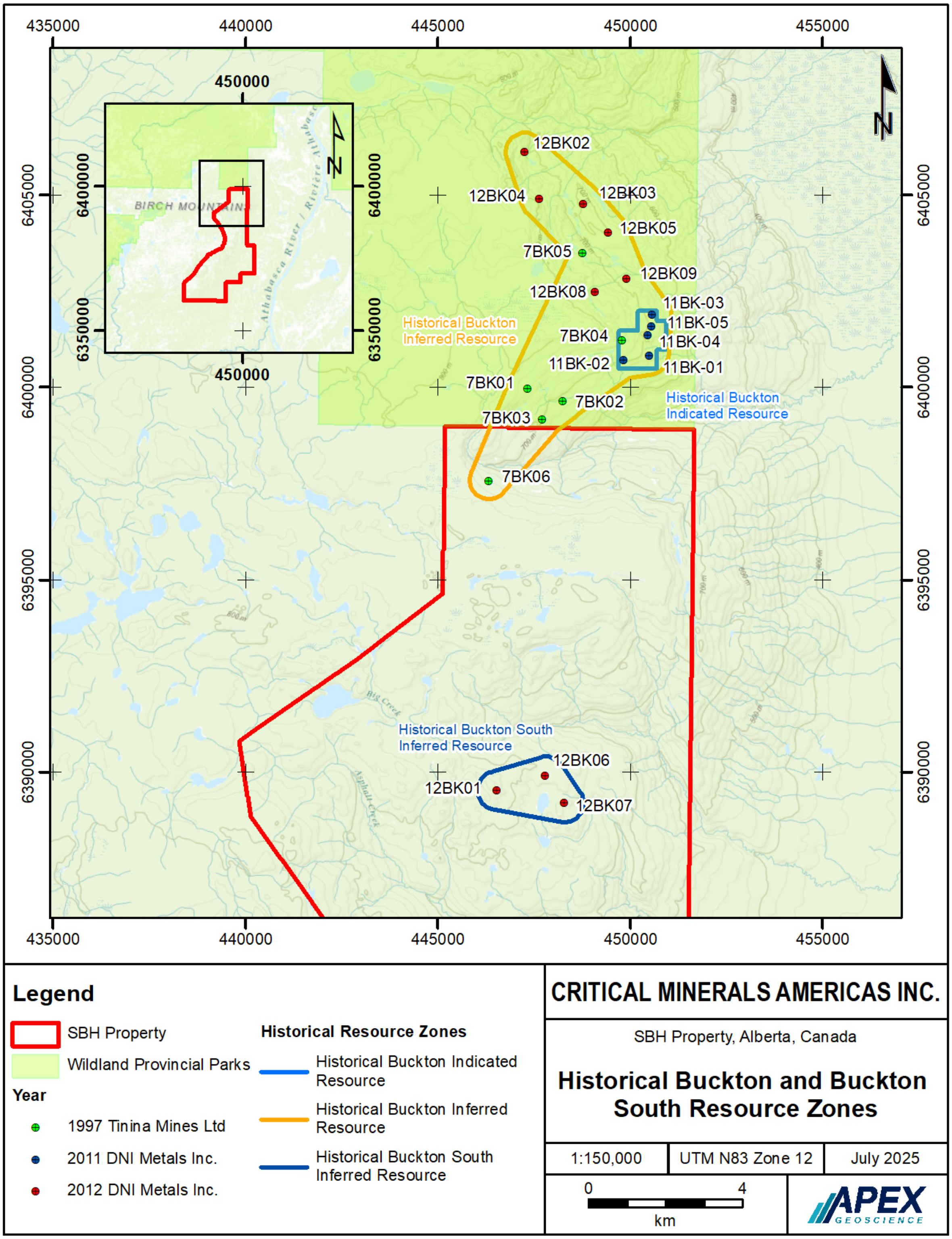
The following section details historical mineral resource studies completed by DNI and has been summarized from various publicly available technical reports prepared by Dufresne et al. (2011), Eccles et al. (2012a; b; 2013a; b; c) and Puritch et al. (2014). Relying on the 2010-2012 drilling results together with historical Tintina drilling, DNI completed five historical mineral resource studies focusing primarily on the mineral resources defined at the Buckton Zone. A separate historical mineral resource estimate was completed in 2013 for the Buckton South Zone by APEX. The location and extent of these historical mineral resources are shown in Figure 6.4.

All of the historical MREs presented in this section were calculated prior to the implementation of the standards set forth in NI 43-101 and CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014) and CIM Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines (November 2019). The Authors have reviewed the information in this section, as well as that within the cited references and has determined that it is suitable for disclosure.

Mr. Dufresne has reviewed the historical 2011, 2012 and 2013 Inferred and Indicated Mineral Resource Estimates (MREs) and the historical 2013 PEA for the Buckton Deposit (Puritch et al., 2014). Based on Mr. Dufresne's assessment, the historical MREs from 2011-2013 were largely constructed in line with current CIM standards and used the current classification framework (CIM, 2014; 2019). However, he noted that the financial information used to evaluate the reasonable prospects for eventual economic extraction (RPEEE) would require changes, and there was not enough information available to the Authors to apply modern constraints such as open-pit optimization. Since 2013, costs for mine construction, processing, and metal extraction methods have also changed significantly. For these reasons, Mr. Dufresne has classified the 2011-2013 MREs as historical and is not treating them, or any part of them, as current mineral resources.

The historical resources summarized below have been included in this Report to demonstrate the mineral potential of the Property, and to provide the Reader with a complete history of the Property. These historical resource estimates were not completed by the current Issuer. A Qualified Person has not done sufficient work to classify any of the historical estimates as a current mineral resource or mineral reserve. The Company is not treating any of the historical estimates as a current mineral resource or mineral reserve. Further work, including a review of historical data and a drilling program, would be required to verify and upgrade the historical estimate to a current mineral resource estimate. The Author cautions that no current Mineral Resources or Reserves exist at the Property.

Figure 6.4 Historical resources outlines and diamond drilling on the historical Buckton Zone and the Buckton South Zone.



6.2.1 Historical Mineral Resources and Historical PEA for the Buckton Zone

6.2.1.1 2013 Historical Mineral Resource Estimate

The historical Updated and Expanded Buckton Resource Study, with an effective date September 9, 2013, was completed on behalf of DNI and is the most recent mineral resource study completed for the Buckton Zone (Eccles et al., 2013c). It relied on all prior drilling data and analytical results from a total of 17 vertical drillholes at the Buckton Zone. Mineral resource modelling and estimation was carried out using a 3-dimensional block model based on geostatistical applications using commercial mine planning software MICROMINE (v12.5.5).

It significantly expanded, superseded, and replaced all prior historical mineral resource estimates for the Buckton Zone, and formed the basis for the historical Buckton PEA which was completed in December 2013 (Puritch et al., 2014). The portion of the historical Buckton Zone that falls within the current SBH Property is known as the Lower Buckton Zone and represents approximately 12.9% of the most recent Buckton Zone historical mineral resource (Figure 6.4). The majority of the historical Buckton Zone MRE, including all of the historical Indicated Mineral Resources, is now contained within Kitaskino Nuwenëné Wildland Reserve which is located to the north and outside of the SBH Property.

The historical Updated and Expanded Buckton Mineral Resource study reported 4,440,112,000 tonnes of Inferred Mineral Resources extending over a 20.4 km^2 area, and 271,938,000 tonnes of Indicated Mineral Resources extending over a 1.5 km^2 area within the Buckton Zone (Figure 6.4 and Table 6.3). The Mineral Resources comprise a wedge of continuous polymetallic mineralization hosted in the Labiche Formation and underlying Second White Specks Formation, which are two flat-lying black shale formations that are stacked to comprise a continuous thick zone of mineralized black shale. Potentially recoverable polymetallic metals include Mo, Ni, U, V, Zn, Cu, Co, Li, scandium (Sc), thorium (Th) and REEs, including lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), and yttrium (Y). The historical Updated and Expanded Buckton Mineral Resources considered RPEEE at the time utilizing a conceptual open pit and based on a NSR base cut-off of US$11/tonne and US$12.5/tonne (per Metal or oxide prices for the two-year trailing average to May 31, 2013, three-years for Tm_2O_3) for the Labiche and the Second White Specks formation shales, respectively.

The historical Updated and Expanded Buckton Zone Inferred mineral resources consists of the lower-grade, mineralized horizon (3.5 billion tonnes) hosted in the Labiche Formation, which overlies the higher-grading Second White Specks black shale horizon (0.9 billion tonnes) beneath it. The two Formations together comprise approximately a 13-140 m thick wedge of mineralized black shale, extending westward from the eastern erosional edge of the Birch Mountains where they are exposed on surface but are under progressively thicker till cover westwards. The historical mineral resource study excluded Shaftsbury Formation black shale material which reported similar grades to Labiche from all intersections.

The historical Buckton Zone Indicated Mineral Resources (see Figure 6.4) is distributed between the Upper and Lower portions as follows: (a) 207 million tonnes in the Upper, lower grade, zone hosted in the Labiche Formation ranging from 13-115 m in thickness (ultimate thickness of the Labiche Shale at the Property is unknown as near-surface portions of it have been locally scoured away by glaciation); and (b) 65 million tonnes in the Lower, higher grade, zone hosted in the Second White Specks Formation shale ranging from 13-23 m in thickness. Block configuration of the historical MRE area is illustrated in Figure 6.5.

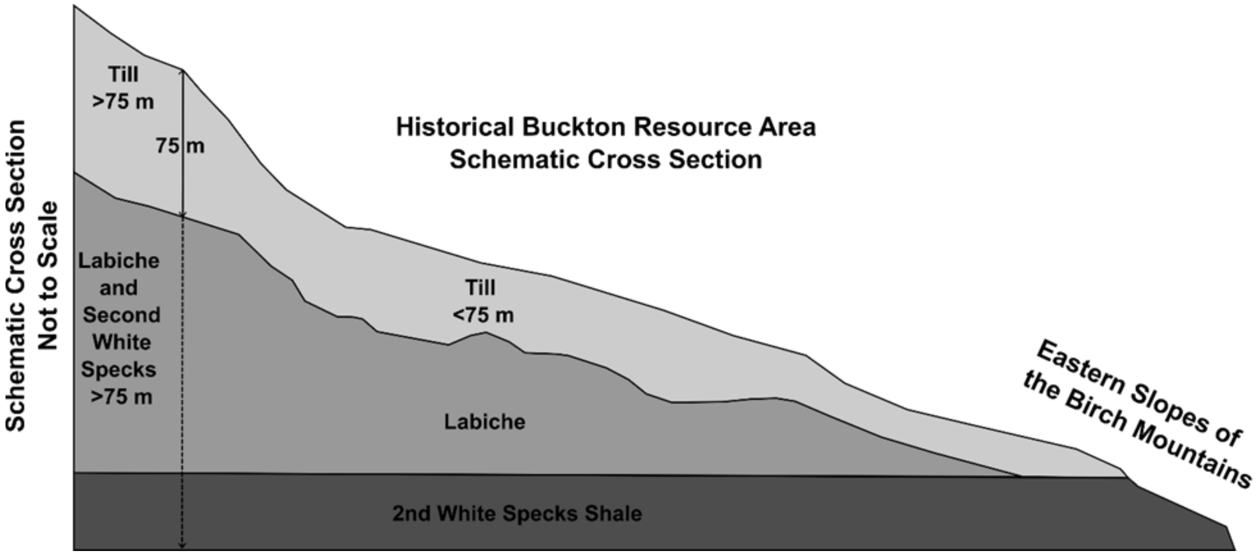
Table 6.3 Historical Updated and Expanded Buckton Inferred Mineral Resources using a reporting NSR cut-off of USD$11.00 per tonne for Labiche and USD$12.50 per tonne for Second White Speckled Shale.

			Labiche Formation (>USD$11.00 per tonne) 3,516,944,000 tonnes (3,876,767,000 tons) [3]					Second White Speckled Shale Formation (>USD$12.50 per tonne) 923,168,000 tonnes (1,017,619,000 tons) [3]					Total shale package (Labiche >USD$11.00 per tonne; Second White Speckled Shale >12.50 per tonne) 4,440,112,000 tonnes (4,894,386,000 tons) [3]				
Metal	**Metal/Oxide Prices ($USD/kg or $USD/lb) [1]**	**Recovery (%) [2]**	**Raw average grade (ppm)**	**Recoverable grade (ppm)**	**USD$ /tonne**	**USD$ /ton**	**Recoverable Kg of metal/oxide**	**Raw average grade (ppm)**	**Recoverable grade (ppm)**	**USD$ /tonne**	**USD$ /ton**	**Recoverable Kg of metal/oxide**	**Raw average grade (ppm)**	**Recoverable grade (ppm)**	**USD$ /tonne**	**USD$ /ton**	**Recoverable Kg of metal/oxide**
MoO_3	$12.89/lb	3	2.9	0.1	$0.00	$0.00	306,000	99.4	3.0	$0.08	$0.08	2,752,000	23.0	0.7	$0.02	$0.02	3,058,000
Ni	$8.34/lb	64	47.7	30.5	$0.56	$0.51	107,417,000	142.4	91.1	$1.68	$1.52	84,116,000	67.4	43.1	$0.79	$0.72	191,533,000
U_3O_8	$60.74/lb	70	5.2	3.6	$0.49	$0.44	12,757,000	31.9	22.3	$2.99	$2.72	20,632,000	10.7	7.5	$1.01	$0.91	33,389,000
V_2O_5	$5.89/lb	7	445.8	31.2	$0.41	$0.37	109,756,000	1218.3	85.3	$1.11	$1.00	78,728,000	606.4	42.5	$0.55	$0.50	188,484,000
Zn	$0.94/lb	52	140.7	73.2	$0.15	$0.14	257,290,000	280.0	145.6	$0.30	$0.27	134,393,000	169.6	88.2	$0.18	$0.17	391,683,000
Cu	$3.64/lb	25	30.8	7.7	$0.06	$0.06	27,100,000	76.0	19.0	$0.15	$0.14	17,529,000	40.2	10.1	$0.08	$0.07	44,629,000
Co	$14.38/lb	72	13.6	9.8	$0.31	$0.28	34,416,000	22.0	15.8	$0.50	$0.46	14,624,000	15.3	11.0	$0.35	$0.32	49,040,000
La_2O_3	$44.58/kg	20	44.3	8.9	$0.40	$0.36	31,167,000	65.1	13.0	$0.58	$0.53	12,024,000	48.6	9.7	$0.43	$0.39	43,190,000
Ce_2O_3	$43.20/kg	30	79.1	23.7	$1.03	$0.93	83,482,000	102.8	30.8	$1.33	$1.21	28,465,000	84.0	25.2	$1.09	$0.99	111,947,000
Pr_2O_3	$140.41/kg	40	9.6	3.8	$0.54	$0.49	13,471,000	14.1	5.6	$0.79	$0.72	5,205,000	10.5	4.2	$0.59	$0.54	18,676,000
Nd_2O_3	$156.16/kg	43	36.0	15.5	$2.42	$2.19	54,442,000	56.1	24.1	$3.77	$3.42	22,276,000	40.2	17.3	$2.70	$2.45	76,718,000
Sm_2O_3	$68.16/kg	47	6.9	3.3	$0.22	$0.20	11,442,000	11.7	5.5	$0.38	$0.34	5,081,000	7.9	3.7	$0.25	$0.23	16,523,000
Eu_2O_3	$2,742.11/kg	61	1.4	0.9	$2.40	$2.18	3,078,000	2.5	1.5	$4.19	$3.81	1,412,000	1.7	1.0	$2.77	$2.52	4,490,000
Gd_2O_3	$105.78/kg	63	5.6	3.5	$0.37	$0.34	12,379,000	10.9	6.9	$0.73	$0.66	6,361,000	6.7	4.2	$0.45	$0.41	18,740,000
Tb_2O_3	$2,190.48/kg	65	0.9	0.6	$1.26	$1.14	2,022,000	1.7	1.1	$2.37	$2.15	999,000	1.0	0.7	$1.49	$1.35	3,020,000
Dy_2O_3	$1,240.31/kg	65	5.0	3.3	$4.06	$3.69	11,524,000	9.4	6.1	$7.57	$6.87	5,637,000	5.9	3.9	$4.79	$4.35	17,160,000
Ho_2O_3	$202.98/kg	64	1.0	0.6	$0.13	$0.12	2,261,000	1.8	1.2	$0.24	$0.21	1,073,000	1.2	0.8	$0.15	$0.14	3,334,000
Er_2O_3	$169.01/kg	62	3.0	1.9	$0.31	$0.29	6,539,000	5.1	3.2	$0.53	$0.48	2,918,000	3.4	2.1	$0.36	$0.33	9,458,000
Tm_2O_3	$97.00/kg	60	0.5	0.3	$0.03	$0.02	958,000	0.7	0.4	$0.04	$0.04	411,000	0.5	0.3	$0.03	$0.03	1,369,000
Yb_2O_3	$102.98/kg	58	3.1	1.8	$0.18	$0.17	6,244,000	4.7	2.7	$0.28	$0.25	2,515,000	3.4	2.0	$0.20	$0.18	8,759,000
Lu_2O_3	$1,273.00/kg	55	0.5	0.3	$0.35	$0.31	957,000	0.7	0.4	$0.51	$0.46	371,000	0.5	0.3	$0.38	$0.35	1,328,000
Y_2O_3	$107.77/kg	67	32.0	21.5	$2.31	$2.10	75,473,000	72.6	48.7	$5.24	$4.76	44,925,000	40.5	27.1	$2.92	$2.65	120,398,000
Sc_2O_3	$4,194.66/kg	24	17.2	4.1	$17.35	$15.74	14,544,000	13.5	3.2	$13.59	$12.33	2,990,000	16.5	3.9	$16.56	$15.03	17,534,000
ThO_2	$252.00/kg	12.5	12.0	1.5	$0.38	$0.34	5,262,000	11.8	1.5	$0.37	$0.34	1,361,000	11.9	1.5	$0.38	$0.34	6,624,000
Li_2CO_3	$2.82/lb	17	394.3	67.0	$0.42	$0.38	235,720,000	302.8	51.5	$0.32	$0.29	47,518,000	375.2	63.8	$0.40	$0.36	283,238,000
Aggregate Gross Recoverable Summary																	
Polymetallics plus rare-earth elements plus Y-Th-Li (without Sc)					$18.78	$17.04	1,105,463,000			$36.07	$32.72	541,326,000			$22.37	$20.30	1,646,788,000
All 25 metals combined (with Sc)					$36.12	$32.77	1,120,007,000			$49.66	$45.05	544,316,000			$38.94	$35.32	1,664,322,000

[1] Average metal or oxide prices for two-year trailing averages dating backwards from 31 May 2013 (three-years for Tm_2O_3). Sources: Metal-pages.com; Asianmetal.com; USGS. (See Table 32 for further pricing detail).
[2] Recovery values based on 2013 stirred-tank bio-leach experiments (CanmetMINING, pers comm, 2013).
[3] Tonne = metric tonne = 1,000 kg (2,204.6 lbs); Ton = short ton = 907.2 kg (2,000 lbs). Numbers may not add due to rounding.

Source: Eccles et al. (2013c)

Figure 6.5 Schematic cross section and block configuration of shale package comprising the historical Buckton Zone Resource.



Source: modified from Eccles et al. (2012b)

The historical Buckton mineral resource estimate was reported in accordance with the CSA NI 43-101 and was estimated using the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines dated November 23rd, 2003 and CIM Definition Standards for Mineral Resources and Mineral Reserves dated November 27th, 2010. The historical Buckton Zone mineral resource estimates described in this section were created prior to the current CIM standards for mineral resource estimation including the CIM Definition Standards for Mineral Resources and Mineral Reserves (May, 2014) and CIM Estimation of Mineral Resources & Mineral Reserves Best Practices Guidelines (November, 2019). The historical mineral resources were block modelled and estimated with appropriate statistical methods that would be acceptable under current CIM standards and guidelines, and in a classification framework that would be acceptable today. However, the financial parameters such as pricing of all of the different metals and critical elements have significantly changed and much of the cost information related to mining and processing is out of date. In addition, approximately 12.9% of the historical Buckton Zone mineral resource exists within the current SBH Property (Figure 6.4). As a result, the Authors of this Report have referred this estimate as a "historical resource" and are not treating it, or any part of it, as a current mineral resource. The historical resources have been included in this Report to demonstrate the mineral potential of the Property, and to provide the Reader with a complete history of the Property. The Authors caution that no current Mineral Resources or Reserves exist at the Property.

6.2.1.2 2013 Historical Preliminary Economic Assessment

In 2013, DNI authorized P&E and Hatch to complete a historical PEA study for the Buckton Zone, which was supported by a technical report titled, "Preliminary Economic Assessment for the Buckton Deposit SBH Property, North-east Alberta", prepared for DNI by Puritch et al. (2014), with an effective date of December 5, 2013, available at www.sedarplus.ca. The Authors caution that the historical PEA was not completed on behalf of the Issuer, is not considered current, and will not be disclosed herein.

6.2.2 Historical Mineral Resources of the Buckton South Zone

A historical Inferred Mineral Resource Estimate was reported for the Buckton South Zone in March 2013 (Figure 6.4). The historical MRE was supported by a technical report titled, "Maiden Inferred Resource Estimate for the Buckton South Zone, SBH Property, Northeast Alberta", prepared for DNI by Eccles et al. (2013b), with an effective date of March 1, 2013.

The historical Maiden Inferred Resource Estimate for the Buckton South Zone reported a 497,000,000-tonne initial Maiden Inferred Resource that relied upon drill results from the 2012 summer drilling program and historical exploration data. Modelling, resource estimation and statistics for the historical Buckton South MRE was completed by APEX on behalf of DNI. Mineral resource modelling and estimation was carried out using a 3-dimensional block model based on geostatistical applications using commercial mine planning software MICROMINE (v12.5.4).

The Buckton South Zone is located 7-8 km kilometres to the south of the historical Buckton Zone. The historical Buckton South Inferred Mineral Resource extends approximately 3.3 km^2 and is hosted within two near-surface stacked black shale horizons, namely, the Second White Specks Formation shale and the overlying Labiche Formation shale. Both shale formations are mineralized with recoverable Mo-Ni-U-V-Zn-Co-Cu-Li-REEs-Y-Th-Sc and are partly exposed on surface. Tonnages of demonstrably equally well mineralized sections of the underlying Upper Shaftesbury Formation (Belle Fourche) black shale was not incorporated into any prior mineral resource estimates despite containing higher Li-Sc grades.

This historical resource is hosted in both the Labiche Formation and underlying Second White Specks Formation black shales. Recoverable polymetallic mineralization includes Mo, Ni, U, V, Zn, Cu, Co, Li, Sc, Th and REEs including La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy and Y. The historical resource estimate is overlain by approximately 110 million tonnes of glacial till overburden cover. The historical MRE for Buckton South Zone was calculated using the estimated recoverable grade for each of the following 25 metals or oxides. The estimated recoverable grade was derived from multiplying the capped estimated grades by the estimated recoverable percentages based upon metallurgical test work completed by DNI on the SBH Property to March 2013.

The historical Buckton South Inferred Resource is based on a US$10/tonne NSR base cut-off and represents all mineralized tonnages that are under less than 75 m of overburden cover. The results of the historical mineral resource for Buckton South are summarized in Table 6.4.

The historical Buckton South Inferred Mineral Resource (Eccles et al., 2013b) is distributed between an upper and a lower portion as follows: 369 million tonnes in the lower grade portion hosted in the 16 m to 62 m thick Labiche Formation, and approximately 128 million tonnes in the higher-grade portion beneath hosted in the Second White Specks Formation which ranges from 11-18 m in thickness (Table 6.4). The foregoing is somewhat thinner at Buckton South than north where it is typically 24-26 m thickness over the Lower Buckton Zone, and 18-20 m typically over the core of historical Buckton Zone.

The historical Buckton South Zone MRE was classified in accordance with guidelines established by the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines dated November 23rd, 2003, and CIM Definition Standards for Mineral Resources and Mineral Reserves dated November 14th, 2004.

Table 6.4 Historical Buckton South Inferred MRE reported at a NSR cut-off of USD$10.00 per tonne.

		LaBiche Formation 369,002,000 tonnes (406,755,000 tons) [2]						Second White Speckled Shale Formation 127,696,000 tonnes (140,761,000 tons) [2]						Total Shale Package 496,698,000 tonnes (547,516,000 tons) [2]				
Metal	Metal price ($USD/kg or $USD/lb) [1]	Raw average grade (ppm)	Recovery (%)	Recoverable grade (ppm)	US$/tonne	US$/ton	Recoverable Kg of metal/oxide	Raw average grade (ppm)	Recovery (%)	Recoverable grade (ppm)	US$/tonne	US$/ton	Recoverable Kg of metal/oxide	Raw average grade (ppm)	Recoverable grade (ppm)	US$/tonne	US$/ton	Recoverable Kg of metal/oxide
MoO_3	$17.63 /lb	2.6	55	1.4	$0.06	$0.05	531,000	93.3	50	46.7	$1.81	$1.65	5,959,000	25.9	13.1	$0.51	$0.46	6,490,000
Ni	$9.07/lb	50.3	80	40.3	$0.80	$0.73	14,852,000	132.1	90	118.9	$2.38	$2.16	15,182,000	71.3	60.5	$1.21	$1.10	30,034,000
U_3O_8	$68.99/lb	5.1	75	3.8	$0.58	$0.53	1,415,000	31.1	90	28.0	$4.26	$3.87	3,578,000	11.8	10.1	$1.53	$1.39	4,993,000
V_2O_5	$7.67/lb	494.0	10	49.4	$0.84	$0.76	18,227,000	1375.6	40	550.2	$9.30	$8.44	70,262,000	720.6	178.2	$3.01	$2.73	88,489,000
Zn	$0.90/lb	153.2	75	114.9	$0.23	$0.21	42,393,000	275.8	90	248.3	$0.49	$0.45	31,702,000	184.7	149.2	$0.30	$0.27	74,095,000
Cu	$3.29/lb	33.9	65	22.0	$0.16	$0.15	8,135,000	85.7	60	51.4	$0.37	$0.34	6,565,000	47.2	29.6	$0.21	$0.19	14,700,000
Co	$22.39/lb	13.3	80	10.6	$0.53	$0.48	3,925,000	20.7	90	18.6	$0.92	$0.83	2,374,000	15.2	12.7	$0.63	$0.57	6,299,000
La_2O_3	$42.84/kg	43.7	15	6.6	$0.32	$0.29	2,418,000	55.2	70	38.6	$1.89	$1.71	4,935,000	46.6	14.8	$0.72	$0.66	7,353,000
Ce_2O_3	$47.40/kg	78.6	25	19.6	$0.93	$0.84	7,247,000	90.0	70	63.0	$2.99	$2.71	8,045,000	81.5	30.8	$1.46	$1.32	15,292,000
Pr_2O_3	$114.98/kg	9.7	30	2.9	$0.33	$0.30	1,074,000	12.7	65	8.3	$0.95	$0.86	1,054,000	10.5	4.3	$0.49	$0.45	2,128,000
Nd_2O_3	$128.61/kg	35.9	35	12.6	$1.62	$1.47	4,641,000	49.4	70	34.6	$4.45	$4.03	4,414,000	39.4	18.2	$2.34	$2.13	9,056,000
Sm_2O_3	$58.66/kg	6.9	50	3.5	$0.20	$0.18	1,277,000	10.1	85	8.6	$0.50	$0.46	1,095,000	7.7	4.8	$0.28	$0.25	2,372,000
Eu_2O_3	$1872.65/kg	1.5	55	0.8	$1.52	$1.38	299,000	2.2	85	1.9	$3.53	$3.21	241,000	1.7	1.1	$2.04	$1.85	540,000
Gd_2O_3	$83.70/kg	5.7	60	3.4	$0.29	$0.26	1,261,000	9.6	85	8.2	$0.68	$0.62	1,044,000	6.7	4.6	$0.39	$0.35	2,305,000
Tb_2O_3	$1551.08/kg	0.9	60	0.5	$0.85	$0.77	202,000	1.5	90	1.3	$2.06	$1.87	170,000	1.1	0.7	$1.16	$1.05	372,000
Dy_2O_3	$864.09/kg	5.4	60	3.2	$2.80	$2.54	1,195,000	8.6	90	7.7	$6.66	$6.04	984,000	6.2	4.4	$3.79	$3.44	2,179,000
Ho_2O_3	$205.82/kg	1.1	60	0.6	$0.13	$0.12	234,000	1.6	75	1.2	$0.25	$0.22	154,000	1.2	0.8	$0.16	$0.15	388,000
Er_2O_3	$197.35/kg	3.2	50	1.6	$0.31	$0.28	585,000	4.6	90	4.1	$0.81	$0.73	524,000	3.5	2.2	$0.44	$0.40	1,109,000
Tm_2O_3	$97.00/kg	0.5	50	0.2	$0.02	$0.02	90,000	0.7	75	0.5	$0.05	$0.04	64,000	0.5	0.3	$0.03	$0.03	153,000
Yb_2O_3	$100.63/kg	3.2	45	1.4	$0.15	$0.13	535,000	4.3	75	3.3	$0.33	$0.30	416,000	3.5	1.9	$0.19	$0.17	950,000
Lu_2O_3	$1024.09/kg	0.7	55	0.4	$0.39	$0.36	142,000	0.6	75	0.5	$0.50	$0.45	62,000	0.7	0.4	$0.42	$0.38	204,000
Y_2O_3	$81.73/kg	33.2	55	18.2	$1.49	$1.35	6,728,000	57.0	90	51.3	$4.19	$3.80	6,545,000	39.3	26.7	$2.18	$1.98	13,273,000
Sc_2O_3	$3881.39/kg	23.4	30	7.0	$27.26	$24.73	2,591,000	17.6	55	9.7	$37.60	$34.11	1,237,000	21.9	7.7	$29.91	$27.14	3,828,000
ThO_2	$252.00/kg	11.9	30	3.6	$0.90	$0.81	1,312,000	11.6	80	9.3	$2.34	$2.12	1,185,000	11.8	5.0	$1.27	$1.15	2,497,000
Li_2CO_3	$2.68/lb	373.1	40	149.2	$0.88	$0.80	55,071,000	362.3	50	181.2	$1.07	$0.97	23,133,000	370.3	157.4	$0.93	$0.84	78,204,000
Aggregate Summary																		
Polymetallics, rare-earth elements, Y-Th-Li (excluding Sc)					$16.32	$14.81	173,789,000				$52.78	$47.88	189,687,000			$25.70	$23.31	363,475,000
All 25 combined (with Sc)					$43.58	$39.54	176,380,000				$90.37	$81.99	190,924,000			$55.61	$50.45	367,303,000

Source: Eccles et al. (2013b)

The historical Buckton South Zone MRE was estimated prior to the current CIM standards for mineral resource estimation including the CIM Definition Standards for Mineral Resources and Mineral Reserves (May, 2014) and CIM Estimation of Mineral Resources & Mineral Reserves Best Practices Guidelines (November, 2019). The historical mineral resource was block modelled and estimated with appropriate statistical methods that would be acceptable under current CIM standards and guidelines, and in a classification framework that would be acceptable today; however, the financial parameters such as pricing of all of the different metals and critical elements has significantly changed and much of the cost information related to mining and processing is out of date. As a result, the Authors of this Report have referred to this estimate as a "historical resource" and are not treating it, or any part of it, as a current mineral resource. The historical resources have been included in this Report to demonstrate the mineral potential of the Property, and to provide the Reader with a complete history of the Property. The Authors caution that no current Mineral Resources or Reserves exist at the Property

6.3 Historical Metallurgical Studies on the SBH Property

Considerable historical metallurgical research and test work has been completed on the SBH Property to assess the collective recovery of metals from the metal-enriched black shales on the Property. While technologies to effectively process such materials were lacking in the 1990s, the widespread success of bioleaching in other mining sectors—notably at the Talvivaara polymetallic black schist operation in Finland—prompted DNI (formerly Dumont) to launch new metallurgical test programs in the 2000s.

Between 2009 and 2012, the first comprehensive leaching and bioleaching tests were performed to evaluate the collective recovery of metals from the SBH Property. This research was carried out by Activation Laboratories (Actlabs); Bureau de Recherches Géologiques et Minières (BRGM); France's leading public institution for Earth Sciences, with globally recognized expertise in biohydrometallurgy; and Alberta Innovates – Technology Futures (AITF). DNI retained Dr. C. L. Brierley, a renowned bioleaching expert, to direct its research and development programs. The test work initially focused on samples from the Second White Specks Formation and was later expanded to include the Labiche and Shaftesbury formations.

DNI's leaching test work programs represented the initial work carried out under test conditions which have not yet been optimized for enhanced metal and REE recoveries, although they were successful in demonstrating that metals can be collectively recovered from the Second White Speckled Shale by simple leaching in sulphuric acid and, especially, by bioleaching, and that excellent recoveries can be achieved for Ni-U-Zn-Cd-Co, middling recoveries for Cu-Li-REEs, and low recoveries for Mo-V. The foregoing tests are the first ever leaching and bioleaching tests completed to evaluate the collective recovery of metals from the SBH Property.

In addition to the primary test work, preliminary studies were conducted to assess the possibility of utilizing carbon dioxide (CO_2) gas for leaching or assisting in the leaching of metals from the black shales. This work was a precursor to a broader evaluation aimed at determining if metallurgical processes used on other black shales (e.g., Kentucky black shales) could be adapted for the black shales and incorporated into preparing preliminary processing flowsheet designs.

6.3.1 Metals Recovery Test Work – Actlabs (2009)

Sulphuric acid leaching tests were conducted at Actlabs by DNI on select samples of Second White Specks Formation shale from litho-section Asphalt-H from samples collected during the 2009 field sampling program. The sulphuric acid leaching tests conducted by DNI at Actlabs in 2009-2010 successfully demonstrated that:

- A collective group of metals can be extracted from the shale by simple leaching under conditions generally simulating bio-heap leaching;
- High recoveries can be achieved for Ni-U-Zn-Cd-Co, and middling recoveries for Cu-Li;
- Recoveries for Mo-V are poor, but can be enhanced by varying the leaching parameters;
- REEs and rare metals contained in the shale, including Li, also report as co-products during leaching; and
- The Second White Specks shale is amenable to bio-heap leaching, provided the shale contains bio-organisms suitable for bio-heap leaching and barring any toxicity presented to bio-cultures by the geochemistry of the shale.

6.3.2 Metals Recovery Test work – BRGM (2009)

The first ever bioleaching tests on the Alberta black shales from the Property were completed by the BRGM on a fresh surface sample of the Second White Specks Formation shale from the Asphalt Zone to investigate suitability of bioleaching for the collective recovery of metals. The Alberta black shales' amenability to bioleaching had never previously been tested, and the BRGM test work was intended as an initial step toward broader test work to follow.

The BRGM conducted bioleaching as well as abiotic leaching tests using sample duplicates and noted that the black shale samples were quite reactive to bioleaching demonstrated by a very short lag time before micro-organisms started to grow upon contact and that the metals solubilized quickly under acid conditions. They also noted that bacterial adaptation to the black shale was immediate and that there was no "poisoning" of the medium by the black shale's geochemistry nor did the black shale's chemistry inhibit start-up of bacterial growth. The BRGM noted that although the black shale material produces acidity quite soon, sulphur content of the samples tested (i.e., low pyrite content) was too low to produce the requisite sulphuric acid by bioleaching alone, and that the 3-4% sulphur content of the black shale is at the lower limit for triggering and maintaining a bacterial growth based on sulphide oxidation alone. As such, the BRGM study concluded that any bioleaching process for recovery of the metals would require addition of sulphur (i.e., sulphuric acid).

The BRGM noted that metal recoveries under biotic conditions were only slightly improved by the presence of bacteria compared to recoveries from the abiotic test and reported the following calculated metals recoveries from bioleaching: Mo-15.6%; Ni-88.4%; U-88%; V-5.8%; Zn-82.8%; Co-88.1%. The BRGM reported the following calculated metals recoveries from abiotic leaching: Mo-2.5%; Ni-86.6%; U-81.9%; V-8.3%; Zn-83.7%; Co-83.2%; Cu-49.4%. The BRGM test results are consistent with, and corroborate, results from subsequent sulphuric acid leaching tests (AITF and Canadian Centre for Mineral and Energy Technology (Canmet)) which similarly concluded that most of the metals quickly solubilized under acidic conditions and that excellent recoveries can be achieved for most of the metals.

6.3.3 Metals Recovery Test work – ARC/AITF (2009-2012)

The bioleaching test work and results obtained rom the BRGM led to the launch of a series of additional bioleaching tests and research at the AITF commencing with initial testing of samples of Second White Specks Formation black shale from the Property. The AITF tests successfully demonstrated the amenability of black shales to bioleaching of metals, that enrichment of bacterial cultures could be obtained from the fresh samples of the Second White Specks Formation shale, and reported recoveries consistent with that obtained from the BRGM test work.

Test work that followed during 2009 to 2012 included acid consumption test work, metal mobility tests, batch amenability tests as well as bioleaching tests with bio-culture adaptation studies focusing on the Second White Specks shale, and later similarly for samples from the Labiche and Shaftesbury formation shales respectively. The test work served to confirm that metals from all three black shale formations could be collectively recovered by bioleaching using captive biocultures, and that metals can be recovered easily with reasonable recoveries.

The AITF bioleaching test work overall confirmed that metals can be readily recovered from the black shales and that their solubilization from the black shales is relatively rapid. Successfully adapting inoculum to recover metals from the Second White Specks black shale as well as from the Labiche Formation black shale was also a breakthrough. Of particular significance was confirming the amenability of recovering metals from the Shaftesbury Formation shale (Belle Fourche Formation) to the same bioleaching procedures as those applied to recover metals from the Labiche and Second White Specks formation shales, suggesting that recoverable metals and critical elements hosted in the Cretaceous black shales at the Property is potentially possible.

6.3.4 Bioleaching and Column Leaching Test Work – Canmet Mining (2012-2014)

The AITF's test work presented above provided the foundation for a subsequent launch of a joint research project between DNI and Canmet Mining at the Mining and Minerals Science Laboratories, Ottawa, to conduct test work to determine the potential for developing a heap leaching process flowsheet for the extraction of metals from the polymetallic black shales at the Property (Cameron et al., 2014).

The primary objective of the Canmet study was to scale up previous column test work conducted by AITF. While focusing on this, the comprehensive multi-element analysis also provided valuable data for assessing the recovery of other metals, including REEs, Lithium (Li), and Scandium (Sc). The results from the Canmet study were subsequently used as the basis for the metals processing flowsheet in the historical Buckton Preliminary Economic Assessment (PEA) study (Puritch et al., 2014).

The test work consisted of a series of investigative initial leaching experiments, over thirty stirred-tank bioleaching experiments and five column bioleaching tests to explore the effects of different agglomeration procedures. Constant pH stirred-tank tests were carried out to assess bioleaching and abiotic (chemical) leaching procedures with various different lixiviants, some of which were selected to simulate bioleaching processing of Chinese weathered elution-deposited rare earth mineralized material. Preliminary mineralogical characterization work was also initiated. Overall, the leaching test work was conducted at a constant pH 2, and endeavored to compare efficacies of bioleaching, to those of dilute sulphuric acid leaching and ammonium sulfate leaching procedures at the same acidity of pH 2.

While the Canmet study advanced bioleaching investigations to the column testing stage, it also gathered leaching data that better simulates natural bioleaching conditions which might be achieved in the field under mild acidity. Considering that the CANMET test work and instrumentation could process larger samples than that of ARC, metals processing flowsheets for the historical Buckton PEA study (Puritch et al., 2014) relied entirely on leaching results and parameters from Canmet's study.

The two bacterial cultures tested during the bioleaching tests were: (a) a mixed culture from Canmet which had been adapted on a low-grade nickel sulphide mineralized material; and (b) a mixed culture obtained from AITF which had been harvested and adapted from the black shales (sub-cultures of this material previously used by AITF for all bioleaching test work carried out on the black shales from the Property). Harvesting and adaptation of the cultures at AITF has been discussed in greater detail in prior reports (Sabag, 2010).

To identify the carrier mineral phases in which Ni, U, V, Mo and some of the REEs (Ce, Nd, Eu, Dy, Y) are contained within the black shale units, a series of sequential chemical extractions were performed based on the procedure developed for geochemical characterization of the black shales. Sequential extraction and leaching tests revealed which metals are most likely to be recovered. The leaching efficiencies correlated directly with the mineral phases hosting the metals. A summary of the blended Second White Speckled and Labiche Formation metal recoveries achieved during the stirred-tank experiments are listed as follows: Mo-3%, Ni-64%, U-70%, V-7%, Zn-52%, Cu-25%, Co-72%, Li-17%, La-20%, Ce-30%, Pr-40%, Nd-43%, Sm-47%, Eu-61%, Gd-63%, Tb-65%, Dy-65%, Ho-64%, Er-62%, Tm-60%, Yb-58%, Lu-55%, Y-67%, Sc-24%, and Th-13% (Cameron et al., 2014).

The Canmet test work demonstrated that recoveries of the light rare earth elements (LREEs) will be lower than those for heavy rare earth elements (HREEs) from the blended Asphalt Zone shale samples will be difficult using conventional bioleaching. A significant proportion of the LREEs examined are associated with recalcitrant mineral phases that are not easily leached under oxidative conditions that would normally be expected to occur under heap bioleaching conditions (i.e. residual phases). It also noted that Cerium is expected to be the most recalcitrant with >30% of the element reporting to the most recalcitrant residual phase.

The sequential leaching tests also showed that nickel, cobalt, and uranium are the most amenable to heap bioleaching, due to a higher proportion of those metals being hosted by carbonate/exchangeable, ligand (labile carbon-associated) and sulphide phases. The tests also showed that vanadium and molybdenum will be the most difficult metals to recover, with ~90% of vanadium associated with the most recalcitrant phases that are not leached effectively at pH 2.

The stirred tank leaching tests showed that leaching of metals from the black shale occurs very rapidly, confirming what had previously been shown by all other leaching and bioleaching tests conducted at the BRGM, AITF and Actlabs. Similar rapid kinetics were also observed during 28-day long stirred tank leaching tests, and 150–200-day long column leaching tests, as the majority of the leaching observed during the 28 day long stirred tank leaching tests occurred during the initial 3-4 days, whereas for the column leaching tests it occurred during the initial 10-20 days, after which only modest incremental metal recovery increases were achieved in both sets of tests. The foregoing observations are significant and are relevant to leach pad designs which were incorporated into the historical Buckton PEA study which provided for a 180 day long leaching time, which is considerably longer than what might be necessary to leach the bulk of metals from the black shales.

Three 28-day identically inoculated bioleaching experiments by Canmet were conducted at pH 2 using a different combination of nitrogen/ phosphorous nutrients. The tests returned similar metal extraction results suggesting that the bacteria are well adapted to the material, and that limited nutrient stimulation is necessary. Inoculation of the stirred tank reactor (STR) experiments with the mixed adapted culture of iron- and sulphur-oxidizing bacteria did not significantly increase metal extractions compared to non-inoculated experiments with dilute H_2SO_4 at equivalent pH, nor did it affect kinetics of metals solubilization as the majority of the metals were leached within the first two days in both the biotic and abiotic tests, an observation consistent with DNI's prior leaching test work conclusions (Sabag, 2010).

In general, the metal recoveries achieved during the 28-day bioleaching tests were slightly higher compared to those from the 2-day long chemical (abiotic) leaching at equivalent pH, although it is unclear if the incremental metal extraction from bioleaching is due to the efficacies of bacterial activity or simply the additional leaching duration of the bioleaching tests.

Acid consumption observed during the above biotic and abiotic tests showed that there is minimal difference between consumption at equivalent pH, confirming prior findings that the black shale tested lacks sufficient sulphide mineralogy to generate the necessary acidity required for the bacterial action alone, and that the addition of sulphuric acid to the leached material is required for the bacteria to effectively leach metals from the black shale.

The effect of temperature was explored in stirred tank experiments conducted at 30°C to evaluate the effect of pH, lixiviant type and concentration, and nutrient addition to metals extraction. Additional experiments were conducted at 5°C, 15°C, and 45°C to evaluate the sensitivity of the leaching kinetics to temperature. The test results showed minimal sensitivity of extractions to temperature, especially among test results at 5°C, 15°C and 30°C, suggesting a low apparent activation energy. A net heat mass balance was not determined during the tests (it is noteworthy that bioleaching reactions at the Talvivaara bio-heap leaching operations are exothermic and generate considerable heat, enabling leaching to proceed at subzero temperatures during the winter months).

The stirred tank leaching tests were successful in identifying leaching parameters which most affect metals extractions (recoveries) and served to further characterize the metallic mineralization in the black shales tested. Principal conclusions from this work, excerpted from Canmet's final report (Cameron et al., 2014), are as follows:

- The leaching efficiencies of the individual elements follow the same trend as determined in the sequential extraction experiments, namely; that REE leaching efficiency increases with decreasing ionic radius and that the order of increasing leaching efficiency mirrors the association of REE with the combined carbonate/exchangeable fraction + ligand fraction, and that leaching of the non-REE metals also correlates with the sequential extraction data showing reasonable recoveries of Ni and U, and low recoveries of V and Mo.
- All leaching tests showed rapid initial leaching kinetics, followed by a period of slow leaching. This observation is consistent with the sequential extraction data which suggests the metals of interest are distributed between distinct phases, ranging from water exchangeable to recalcitrant under very aggressive conditions. This observation is also consistent with all prior leaching test work on all samples of the shales (the Second White Specks, the Labiche and the Belle Fourche formation shales).
- The stirred tank leaching tests depict an overall general trend of better (higher) metal extractions with higher acidity (i.e.: decreasing pH).
- Metal extractions are also enhanced by the addition of $(NH_4)_2SO_4$ when compared to extractions with only dilute H_2SO_4 at equivalent pH. In an ultimate production scenario, however, it is of note that the increased extraction is achieved at the added cost of the $(NH_4)_2SO_4$ and additional H_2SO_4 which would be required to lower the pH of the medium.
- The stirred tank leaching tests showed that there is no overwhelming advantage during bioleaching to nutrient addition to stimulate the bacteria in the mineralized shales.
- Metal extractions were generally higher after 28 days of bioleaching compared to 2 days of chemical leaching; however, it is unclear if the incremental metal extraction during bioleaching is due to the bacterial action on the metal-containing phases or simply the additional leaching time that resulted in attack of the more recalcitrant metal-bearing phases.

The leaching tests also demonstrated that metal extraction has a low dependency on temperature in the range of 5 to 45 ºC. This is an important conclusion considering the cool northern climate of the location of the SBH Property and the relatively low levels of sulphide mineralization in the material which may prove to be too low to sustain heat generation from oxidation of pyrite alone during bioleaching and requires the addition of sulphur.

The Canmet column leaching test work was successful in demonstrating that it is technically feasible to leach REE and non-REE metals from the black shale samples tested (Second White Specks Formation shale) under conditions designed to replicate the environment within a bioleaching heap operation. The test work concluded that:

- Due to high clay content, the shales would have to be agglomerated in order to improve heap structure and stability.
- Further test work is needed to optimize the agglomeration process with DNI material; and it is possible that different agglomeration techniques may be optimal for the different stratigraphic sections of the mineralization, as the different stratigraphic sections of the shales have visibly different mineralogy content.
- Full-height column tests are required to determine the effect of compaction on the permeability of the agglomerated material, as permeability can be expected to constrain heap lift height and the solution application rates.
- The consumption of sulphuric acid is one of the major operating costs to any heap bioleaching operation, and its reduction would be key to enhanced economics. Acid consumption can be reduced by a number of ways including reducing the acid dose during agglomeration; and recycling a portion of the acid (some of the tests reported similar final extractions when agglomerated with dilute H_2SO_4 (i.e. simulated PLS) to test 5% H_2SO_4, and 10% H_2SO_4, respectively).
- Comparison of the metal leaching kinetics suggest that the amount of acid used during agglomeration has a large impact on the initial rate of metal leaching, whereas the final amount leached after 50 days shows little dependency on the acid addition during agglomeration.
- There is a balance between acid dose during agglomeration and the time required for leaching. Additional column experiments may be used to further refine the acid dose during agglomeration at levels between 0 and 5% H_2SO_4.
- Majority of the experiments were conducted at constant pH 2 and did not succeed in extracting V or Mo in any significant amount. Vanadium and Mo represent a meaningful portion of the contained metal value within the shale, and both metals are relatively recalcitrant at pH 2, whereas lower pH levels were shown to slightly improve the leaching of V and Mo during COL2 tests. Additional experiments at lower pH levels, initially in the range of pH 1.7-1.9, might succeed in enhancing recovery of the two metals.
- Experiments conducted with 0.5M $(NH_4)_2SO_4$ consistently leached higher amounts of the valuable metals compared to dilute H_2SO_4 at equivalent pH. However, the increased extraction comes at a cost of the $(NH_4)_2SO_4$ and additional H_2SO_4 that is required to lower the pH of the medium.
- While there are existing technologies for extracting REEs from $(NH_4)_2SO_4$ media at pH ≥3 based on the processing of Chinese weathered elution-deposited REE mineralization, recovery of some of the non-REE metals of interest may be more problematic and will require additional research.

Canmet noted that since the black shale sample tested for all of the experiments was a blended composite sample taken from trenching of an outcrop litho-section exposed on the valley wall of Asphalt Creek (Location Asphalt-H), its response to leaching may or may not be representative of a mineral deposit which might be identified in the area, and might be somewhat affected by the amount of chemical weathering (i.e. oxidized pyrite). Duplicating some of the test work on samples of fresh drill core would be an important next step to verify metal extractions and acid consumptions documented from the test work.

Canmet issued its final report in 2014, and no further work has been carried out since to expand on its findings, and those of the AITF, to advance collective metals recovery processing metrics toward testing of larger samples (bulk samples) with the natural view of advancing development of potential metals enriched Alberta black shales at the Property.

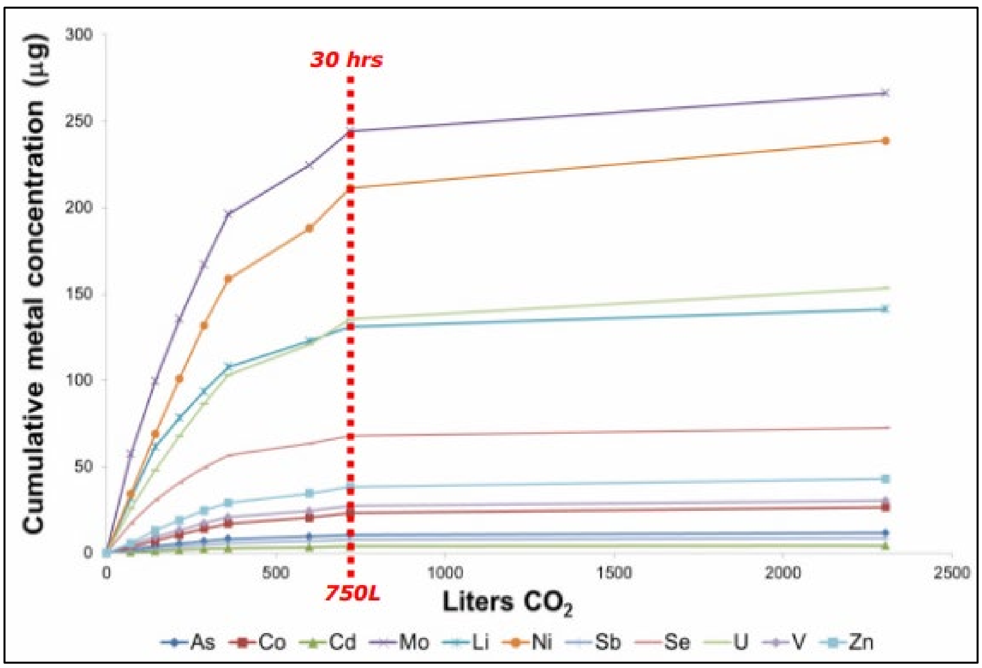
6.3.5 Early-stage CO_2 Tests

Preliminary test work was started in 2010 to begin assessing potential of the shale as a carbon dioxide (CO_2) "sink" to evaluate its capabilities for sequestering CO_2. The foregoing included a series of CO_2 sparging tests, on samples from the Second White Specks Formation shale from the Property and collected baseline laboratory information on the reactive properties of fresh shale samples when injected with CO_2 under ambient pressure given that black shales are known to have capacity for sequestering CO_2 under pressurized conditions, and given that certain "spent" black shales and similar material also have similar capacity. Kentucky black shale offers some interesting insights in this regard.

Incidental solubilization of metals observed during the CO_2 sparging test work demonstrated that metals can be liberated (extracted) from the shale under mildly acidic conditions and that acidity itself may be the decisive factor to achieving metals extraction rather than the type of acid used in leaching (all prior leaching and bioleaching test work had relied on sulphuric acid solutions whereas the CO_2 sparging tests did not). The foregoing discovery offers new possibilities for use of CO_2 as a pre-treatment to other more acidic leaching methods, with the added collateral benefit of also consuming CO_2.

The above was corroborated by all the work at Canmet, as well as subsequent test work by the ARC. The 2012 test work indicates that most of the metal recovery occurred after 750 liters of CO_2 were passed through reaction vessel during 30 hours of reaction, as shown in Figure 6.6 and Table 6.5. The CO_2 pre-treatment reduces mineral pH buffering capacity of the shale to benefit the heap leaching process by reducing the amount of acid and/or time required to bring the shale matrix to optimum heap leaching conditions (Critical Minerals Americas Inc., 2023)

Figure 6.6 Cumulative metals extractions from shale by CO_2 leaching, extraction timeline (2012 test work).



Source: Critical Minerals Americas Inc. (2023)

Table 6.5 Comparison of bioleaching/acid recoveries to CO_2 leach test work.

Element	Bioleaching/Acid Recoveries (2011 R&D)	CO_2 Leach ($NaNO_3$ + CO_2 Leach) (2012 R&D)
Mo	51%	9.8%
Ni	89%	3.3%
U	100%	10.5%
V	51%	0.1%
Zn	100%	0.3%
Co	91%	2.6%
Cd	100%	0.8%
Li	58%	5.7%

Source: Critical Minerals Americas Inc. (2023)

No further work was carried out to expand on these findings to enable estimation of quantities of CO_2 which might be consumed during leaching, nor to test the ability of "spent" shale collected from tails of leaching test work to absorb (sequester) CO_2.

7 Geological Setting and Mineralization

The following sections are drawn directly from Alberta Government assessment reports, historical mineral resource technical reports and the historical PEA published for the Property (Sabag 1996, 1998, 1999, 2008, 2010, 2012, 2014; Dufresne et al., 2011; Eccles et al., 2012a, b; Eccles et al., 2013a, b, c; Puritch et al., 2014). The Authors have reviewed these sources and consider them to contain all the relevant geological information regarding the Property. Based on the review of available literature and data, the Authors takes responsibility for the information herein.

7.1 Regional Geology

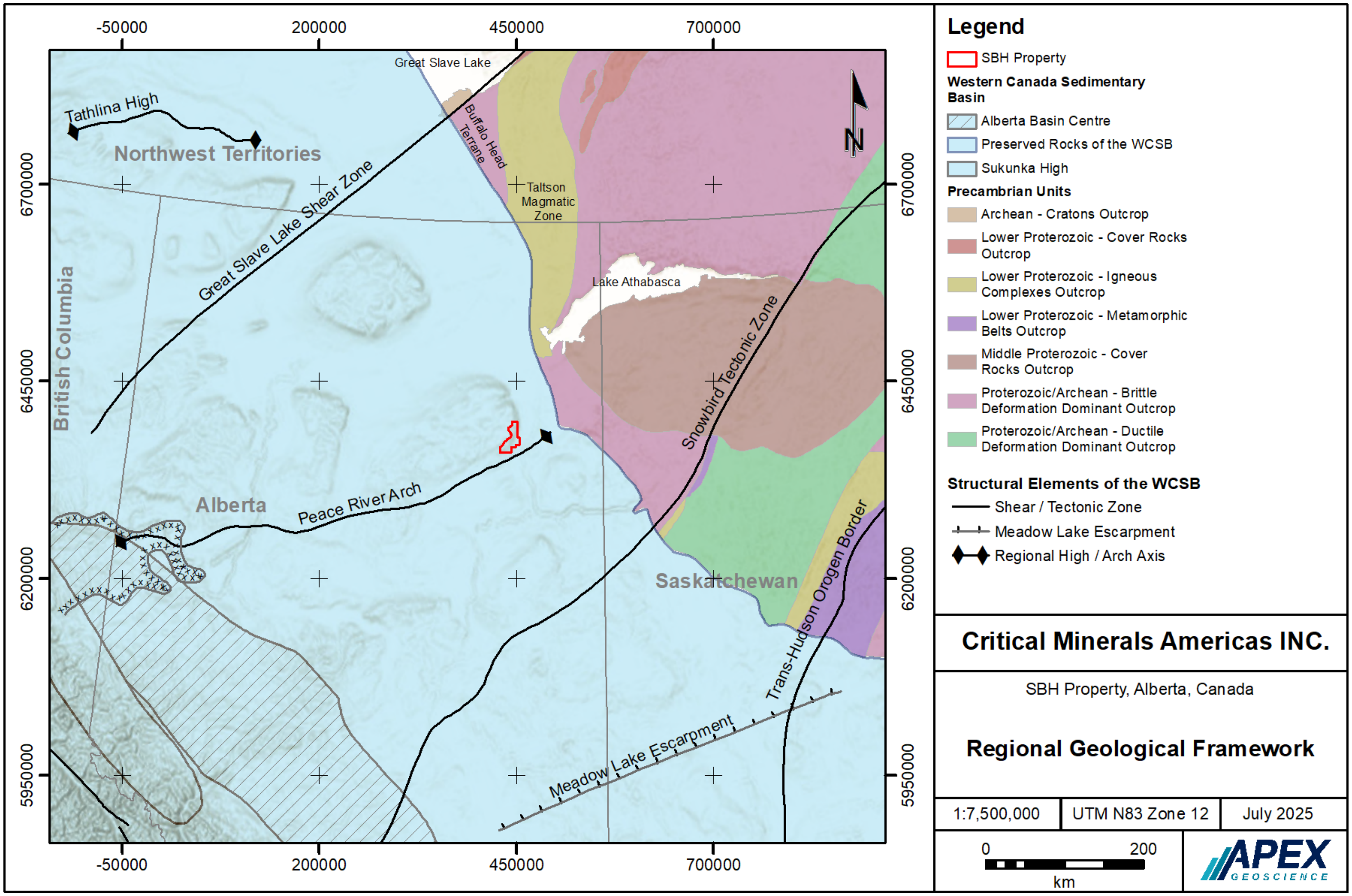
Alberta is mostly underlain by sedimentary sequences of the Western Canada Sedimentary Basin (WCSB), which is bounded by the Canadian Shield to the northeast and by the Rocky Mountains to the west. The WCSB consists of a wedge of flat-lying Devonian sediments (carbonate, evaporite and clastic red beds) overlain by equally flat-lying Cretaceous and Cenozoic clastic sedimentary rocks. The sedimentary rocks are up to 7,000 m thick in Southwestern Alberta thinning out to an erosional edge in Northeastern Alberta (Figures 7.1 and 7.2).

Precambrian age rocks underlying the region occur within the Talston Magmatic Zone (TMZ) and the Rae Province. The TMZ is a zone of Paleoproterozoic magmatic rocks marking the boundary between the Archean age Rae Province to the east and the Proterozoic age Buffalo Head Terrane to the West (Ross et al., 1991, 1994). The TMZ is characterized by a sinuous aeromagnetic fabric consistent with the geology of its exposed portions in the northeast of the region where large anastomosing mylonitic shear zones cut through large (up to 50 km diameter) granitic batholiths intruding 2.0-1.8 billion year (Ga) old ortho - and paragneissic rocks. The TMZ can be traced North for several hundred kilometres from the Snowbird Tectonic Zone (approximately 100 km Southeast of Fort McMurray) to the Great Slave Lake Shear Zone where it is displaced to the Northeast and continues as the Thelon Magmatic Zone (Figure 7.1).

The near-surface regional geology (Figure 7.3; Table 7.1) consists of the Lower Cretaceous Mannville Group sedimentary rocks and the Middle Cretaceous Colorado Group sedimentary rocks from stratigraphic base to top:

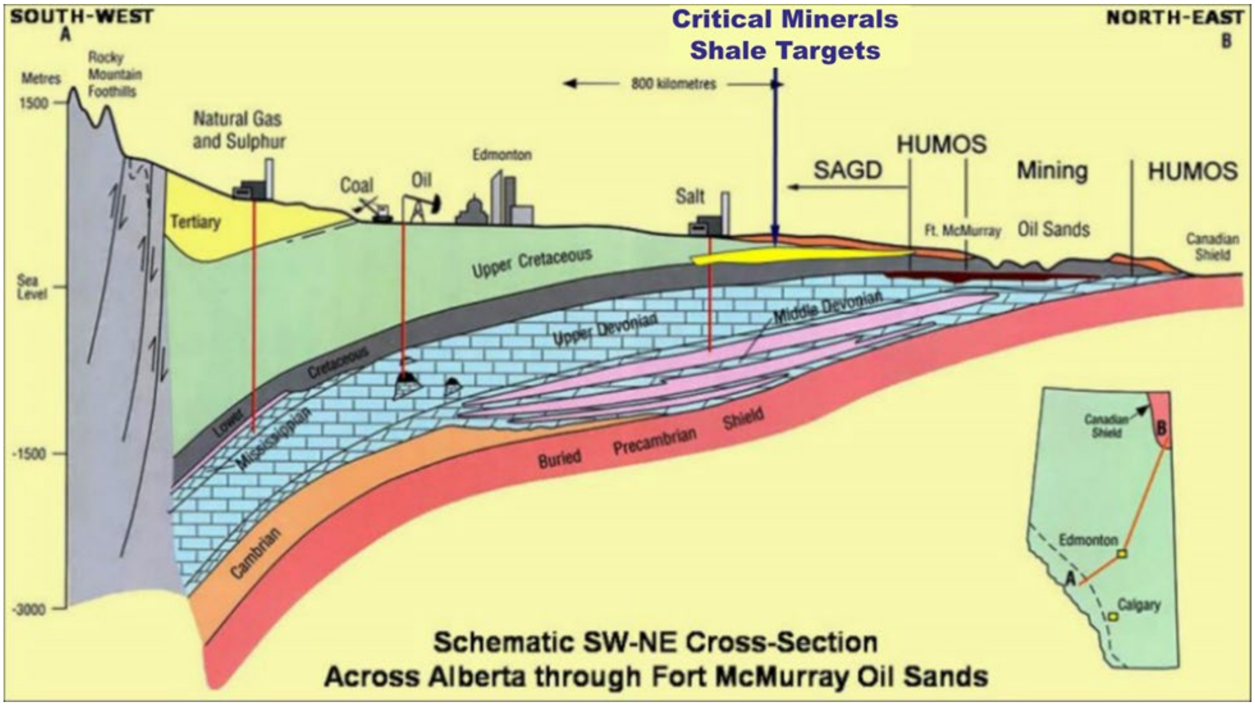
- The Clearwater Formation of the Mannville Group;
- The Grand Rapids Formations of the Mannville Group;
- The Westgate Formation of the Colorado Group;
- The Fish Scales Formation of the Colorado Group;
- The Belle Fourche Formation of the Colorado Group;
- The Second White Specks Formation of the Colorado Group; and,
- The Lea Park Formation of the Colorado Group

Figure 7.1 Regional geological framework of CMAI's SBH Property



Source: After Mossop and Shetsen (1994) and Burwash et al. (1994).

Figure 7.2 Regional geological schematic cross section of the Western Canada Sedimentary Basin. SAGD (Steam Assisted Gravity Drainage). HUMOS (Hydraulic Underground Mining of Oil Sands).



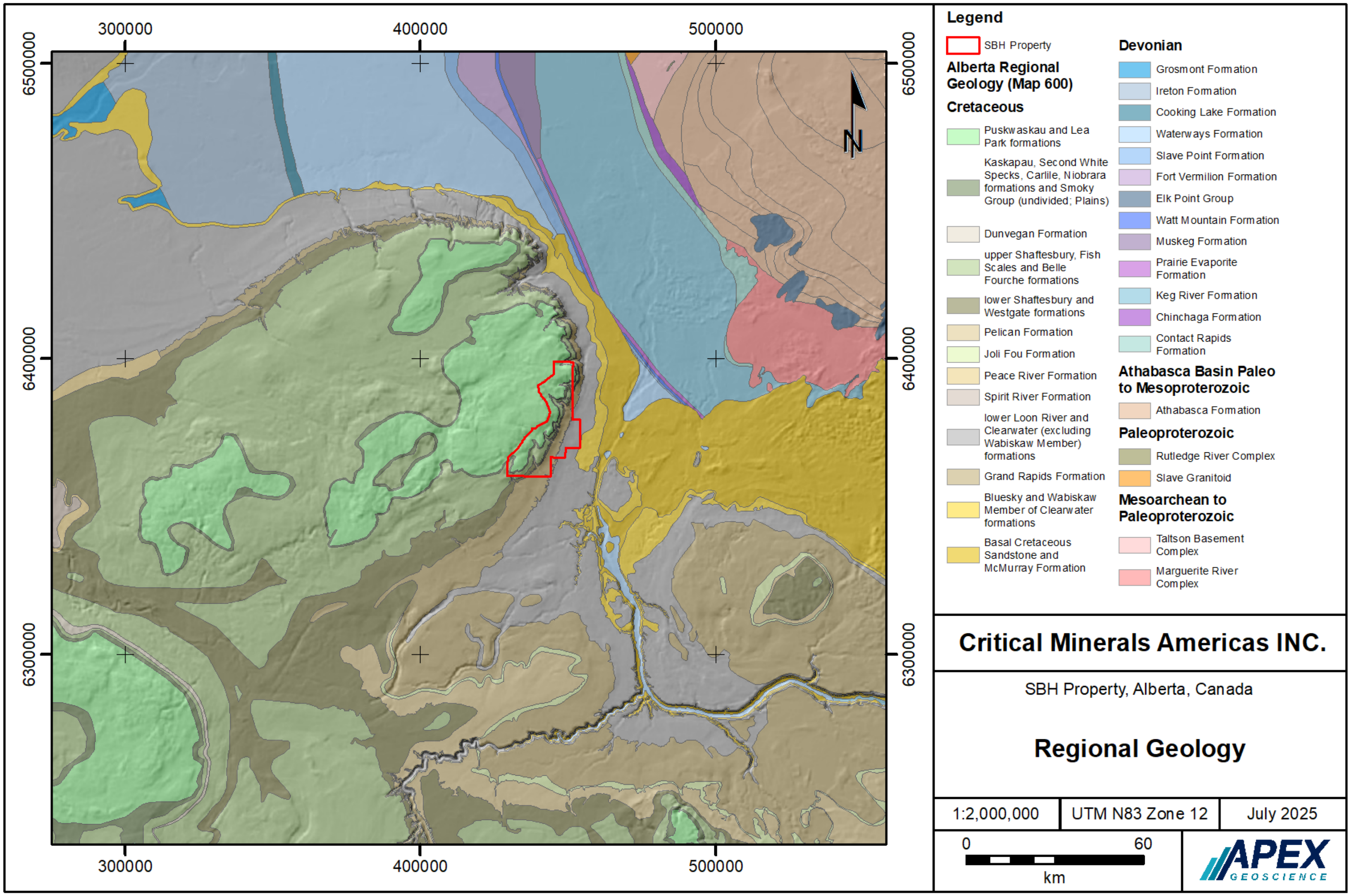
Source: Modified from Sabag (2008)

Historically, outcrop exposures of the Colorado Group in the Alberta Plains is limited to Northeastern Alberta, where bedrock units above the Pelican Formation have commonly been assigned to the Labiche Formation (Wickenden, 1949; Green et al., 1970; Hamilton et al., 1998; Okulitch, 2006). However, Southern and East-central Alberta subsurface strata equivalent to the lower part of the Labiche Formation are divided into the Westgate, Fish Scales and Belle Fourche members of the Shaftesbury Formation based on drillcore observations and analysis of downhole geophysical well logs (Bloch et al., 1993; Stancliffe and McIntyre, 2003; Tu et al., 2007).

The geological mapping and formation nomenclature in the Birch Mountains have been revised in recent years (Prior et al., 2013; AGS, 2019). This includes the Lea Park Formation (also known as the Labiche Formation or the Colorado Shale), the Second White Specks Formation (also known as the Second White Speckled Formation/Shale), the Belle Fourche Formation (also known as the Shaftsbury Shale or Shaftsbury Formation), and the Fish Scales Formation (grouped within the Belle Fouche, referred to as the Fish Scales Member or the Shaftsbury Formation). For the purposes of Section 7 of this Report, both the historical and revised formation names will be used. The historical/local formation names will be used for the remainder of this Report to maintain consistency with historical reports.

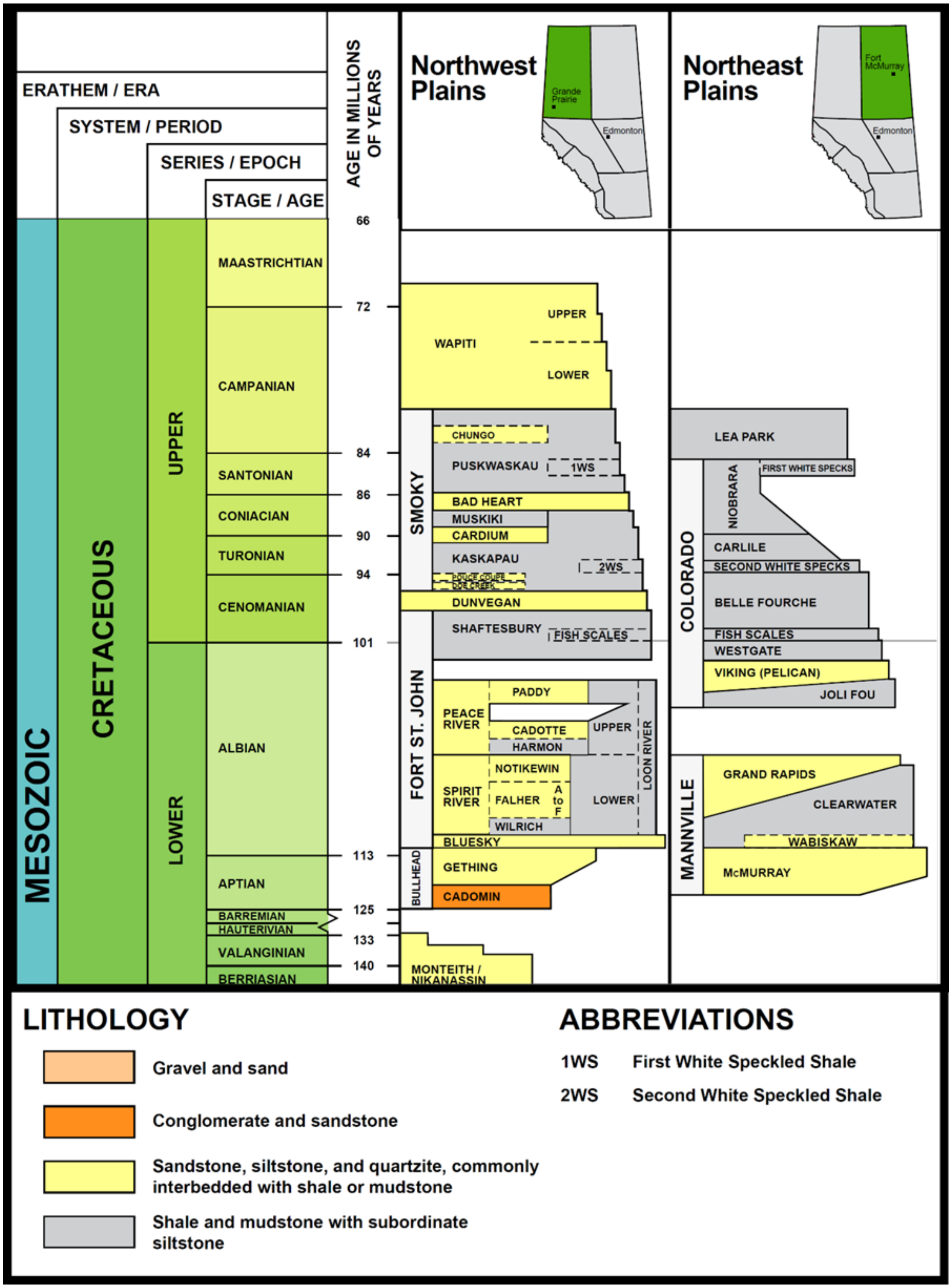
The Clearwater Formation is a collection of fine grained marine clastic sediments which were deposited as a result of a transgressive event which saw the end of the development of the McMurray delta. The Clearwater Formation also contains several shale units that are locally used as stratigraphic markers, these include in ascending order (above the Wabiskaw member) the Clearwater "A" marker and the "Regional Marine Shale".

Figure 7.3 Regional geology of the SBH Property.



Source: After Prior et al. (2013).

Table 7.1 Regional stratigraphy of Northern Alberta.



Source: Alberta Geological Survey (2019)

The Clearwater Formation grades laterally and vertically into the Grand Rapids Formation which represents the contemporaneous development of a prograding barrier bar complex which thins to the northwest. The

Grand Rapids Formation sandstones are easily distinguished from those of the underlying Clearwater Formation due to the usually considerable amount of glauconite and shaley interbeds in the latter.

The Colorado Group is dominated by marine shale that is occasionally punctuated by coarser sediments deposited during brief high-stands. A subsurface stratigraphic compilation using existing oil and gas wireline logs shows that the Belle Fourche, Second White Specks (Speckled) Formation and Lea Park (Labiche) Formations extend under the entire SBH Property and likely under all of the Birch Mountains. The Colorado Group reaches a maximum thickness of approximately 1,500 m in Northwest Alberta and is generally thickest nearer the Cordillera. The erosional edge of the Colorado Group in Northeast Alberta is represented by a shale dominated package of strata which reaches a maximum thickness of approximately 450–500 m in the Birch Mountains.

Black shale, which is commonly described as a dark-coloured, laminated, fine-grained sedimentary rock that is relatively rich in organic matter (>0.5 wt.% organic carbon; e.g., Huyck, 1989), has occurred throughout the geological record, but the Cretaceous Period contains the most extensive record of black shale deposition in both shallow-water and deep ocean localities (e.g., Arthur and Schlanger, 1979). Geological units within the Colorado Group are comprised of organic-rich black shale.

The Colorado Group includes two unequivocal high-carbon content black shale formations: the Fish Scales and the Second White Specks (or Second White Speckled Shale Formation) formations, which represent distinctive basin-wide, organic-rich stratigraphic markers. The Fish Scales is located below the Belle Fourche Formation in Eastern Alberta or as a member of the Shaftesbury Formation in Northwestern Alberta and consists of a concentration of fish bones, teeth and scales, within shale (and minor sandstone) with relatively high total organic carbon values of 5-10% (Bloch et al., 1993). The Fish Scales unit is generally less than 20 m thick and can contain >75% fish debris. It may represent either an anoxic event at the Albian-Cenomanian boundary which prevented the normal decay of the bioclastic material and/or a transgressive lag deposit. It is poorly delineated and is normally characterized as a fish scales-bearing mudstone with minor associated sandstone and conglomerate, with up to 8% organic carbon (Bloch et al., 1993).

The Belle Fourche (Shaftesbury) Formation overlies the Fish Scales Formation and consists of massive mudstone characterized by low amounts of total organic carbon. A distinctive foraminiferal assemblage and a lack of bioclastic material distinguish it from the underlying Fish Scales Formation and the overlying Second White Specks (Bloch et al., 1993). The Belle Fourche Formation is not well exposed in the region with the exception of many slump zones throughout the Birch Mountains that contain masses of shale and mudstone.

The Second White Specks (Speckled) Formation is named for the common occurrence of calcareous coccoliths. Black shale, which dominates this interval, is characterized by elevated total organic Carbon content, exceeding 10% by weight. The Second White Specks shale generally contains a characteristic basal bioclastic sandstone layer, referred to as the siliciclastic bone bed (thus differentiating it from the Fish Scales Marker Bone bed - FSMB). The bone bed ranges in thickness from a few centimeters up to 1.2 m, is normally calcite cemented and can occur as multiple beds. Just above the bone bed there is usually a thin (approximately 10 cm) limestone or carbonate cemented siltstone bed overlain by a 5-10 m interval of high carbon black shale marked by numerous thin (1-20 cm) bentonite seams. The Second White Specks Formation is approximately 11-26 m (average thickness of 21 m) within the SBH Property.

The Lea Park (Labiche or Colorado Shale) Formation, overlying the Second White Specks Formation and equivalent to parts of the Colorado Group in central Alberta, is poorly studied given the lack of exposures in the area and the lack of drill core. Two small and badly slumping outcrops of massive gray Lea Park shale previously observed well above those of the Second White Specks Formation have been assumed to represent the youngest Cretaceous strata preserved in the Birch Mountains area of North-East Alberta. Drill intercepts of the Lea Park at the SBH Property range from 13-115 m although its exact thickness is unknown as portions of this uppermost bedrock shale have been removed by glaciation, affected by glacial tectonics or have slumped along the sloping eastern edge of the Birch Mountains.

Structural elements in Northeast Alberta include regional and localized features, many of which occur within the Precambrian basement, but some of which are extended into the overlying stratigraphic sequence. The most predominant zone of disturbance in Northern Alberta is the Peace River Arch, which trends across Northeastern Alberta within a wide zone passing to the North of Fort MacKay, across the Southern parts of the Birch Mountains. It comprises a 140 km wide zone of structural disturbance that was active from as early as the Late Paleozoic to the Late Cretaceous. The Peace River Arch has no readily discernible geophysical expression, although it does display subtle crustal uplift at the Mohorovičić discontinuity.

Younger structures in the area are dominated by a regional series of Northeast trending faults passing through the Fort MacKay area including a dextral strike-slip fault documented by stratigraphic correlation of oil/gas well data (Martin and Jamin, 1963). Despite limited drilling penetrating the Precambrian age basement rocks, at least some of the Northeast trending structures noted in the sedimentary rocks reflect Precambrian features, and that offsets along these structures also include a substantive vertical component defining a complex horst/graben framework.

Glacial history of the region is complex and not clearly understood. Principal ice direction throughout the Northeastern portion of the region is Southwesterly; although ice flow is believed to have splayed around (and over) the Birch Mountains such that throughout the balance of the region there is evidence of crosscutting composite directions, manifested as multiple till sheets and fluted topography.

7.2 Property Geology

Bedrock exposures throughout the Birch Mountains are scarce (<2%) and, given the flat-lying stratigraphy, they are restricted to valley walls of the many creeks and rivers which define incisions confined to the eastern and southeastern erosional edge of the Birch Mountains, over a 5-10 km wide arcuate band defining a 70 km long arcuate lobe of the Birch Mountains. The available outcrop exposures throughout the area, nonetheless, enable intermittent observation and sampling across 300-350 m thickness of Cretaceous age stratigraphy, extending upward from the top of the Mannville to well into the Colorado Group, straddling the Albian-Cenomanian boundary, providing exposures of six separate Formations: the Clearwater/Grand Rapids Formation, the Viking/Pelican Formation, the Westgate Formation, the Fish Scales (Shaftesbury) Formation, and the Second White Specks (Speckled) Formation, and the Lea Park (Labiche) Formation. Many of these Formations are eroded to the east of the Birch Mountains and to its south, and their exposures can be seen in cliffs and escarpments along the eastern and southern erosional edges of the Birch Mountains, and in valley walls of rivers and streams draining the Birch Mountains. The property geology of the SBH Property is presented in Figure 7.4.

The Lea Park (Labiche or Colorado Shale), Second White Specks (Speckled) Formation, and Belle Fourche (Shaftesbury Black Shale) dominate the near surface geology over the Property and the broader Birch Mountains. Lea Park Formation is near surface under a few meters of glacial material (mostly scoured Lea Park shale and mixed glacial debris), but much of it is progressively eroded away southward nearer the Asphalt Zone area where the Second White Specks Formation is at, or very near, the surface. There are no known surface exposures of the Belle Fourche Formation, although it has been mapped and sampled in many valley wall litho-sections. All the three foregoing black shale units are exposed in valley walls and have all been sampled and mapped in great detail in prior years.

Stratigraphic lateral continuity across the Birch Mountains is excellent as it is elsewhere throughout the region, evidenced also by the exceptional continuity of the McMurray Formation hosting the oil sands over many 100's km^2 situated at and near surface in the flat topography some 500 m below the top of, and surrounding the Birch Mountains. This reflects the virtually tabular stacked sequence of sedimentary strata, the black shales being the topmost layers which are near (or at) the surface of the Birch Mountains and are exposed intermittently in laterally extensive terraces and litho-sections in valley walls of creeks and rivers draining it. The foregoing litho-sections have been invaluable to the exploration of tabular geology over the area and at the Property. A generalized North-South cross section across the northern half of the Property is presented in Figure 7.5, showing all prior diamond drilling and oil-gas wells, extending beyond the Property's north boundary to the northern tip of the historical Buckton Deposit.

The Second White Specks and Lea Park (Labiche) black shales represent the principal polymetallic shales which have been targeted by all historical work, both of which host zones of recoverable base metals, U, REEs and specialty metals (Sc, Li, and Th). Similarly, recoverable metals of similar grades (better Li-Sc) are also hosted in the underlying Belle Fourche (Shaftesbury Formation shale).

7.2.1 Stratigraphy

Six distinct formations have been mapped and sampled in historical work across the Birch Mountains which include, in chronological order from oldest to youngest:

- The Clearwater/Grand Rapids Formation;
- The Viking (Pelican) Formation;
- The Westgate Formation;
- The Fish Scales/Belle Fourche (Shaftesbury) Formation/Member;
- The Second White Specks (Speckled Shale) Formation; and,
- The Lea Park (Labiche or Colorado Shale) Formation.

These Formations are described below and shown in Figure 7.5, presenting descriptions from north of the vicinity of Pierre River, through Asphalt Creek, and across the Buckton Creek area to the McIvor River and its tributaries north of the Property.

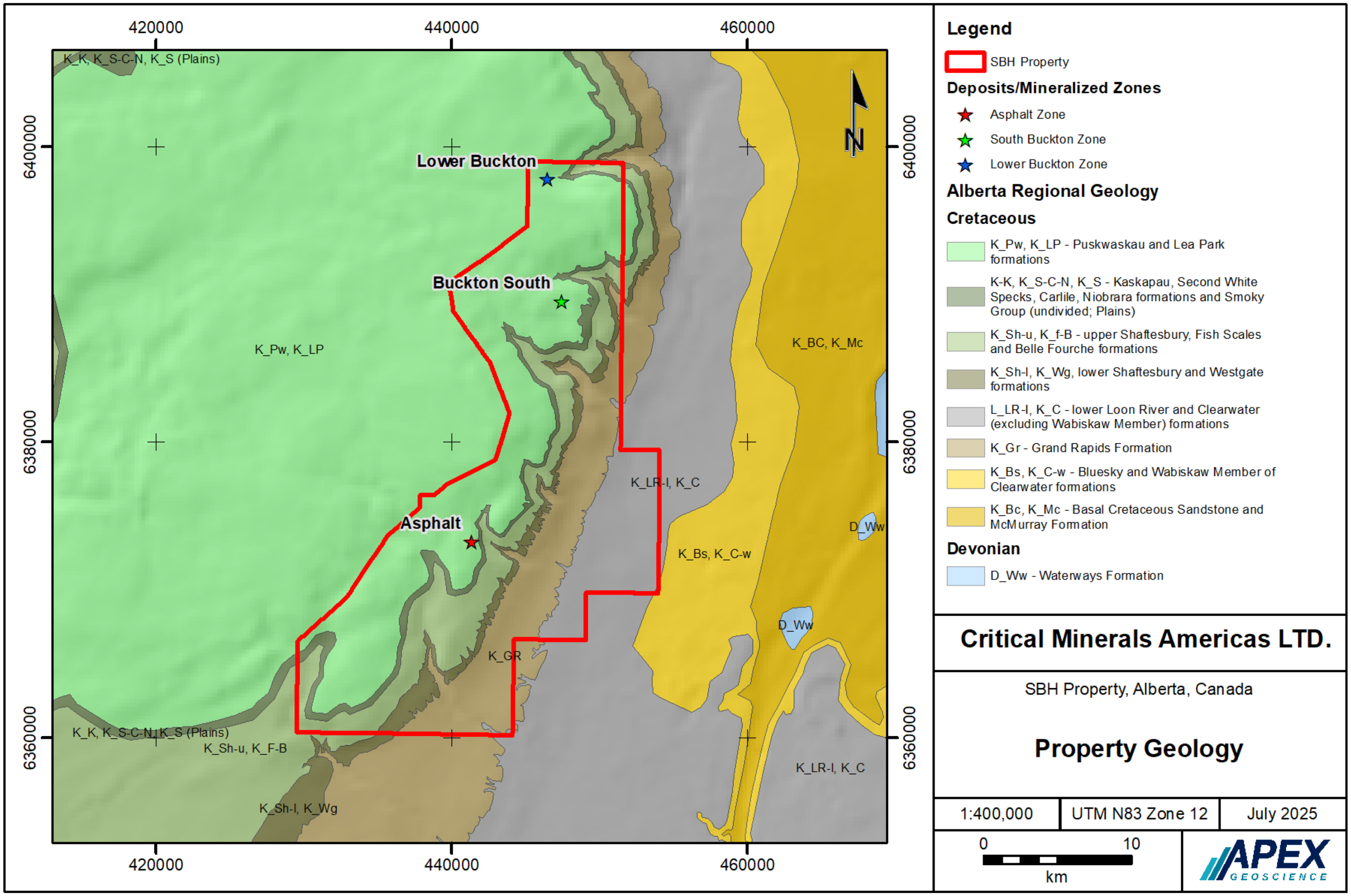
7.2.1.1 Clearwater/Grand Rapids Formation

The Clearwater/Grand Rapids Formation can be seen throughout the Birch Mountains area in exposures at the lowest elevations in areas around McIvor River located in the northern portion of the Property. The Formation is generally characterized by thinly interbedded, dirty glauconitic sandstones, silty shales and mudstones with occasional interbedded channel sandstones which range in thickness from 5-50 cm and are massive in appearance with occasional cross bedding and contain lags of very coarse-grained sand with coal, occasional bivalve coquina, and locally abundant ammonites. The interbedded sandstones and shales are locally cut by channel-filled sands which are often carbonate cemented and appear as prominent iron-stained pods between 10-50 cm in thickness and 1-5 m in width. Minor disseminated pyrite has been observed in samples from this unit.

7.2.1.2 Pelican (Viking) Formation

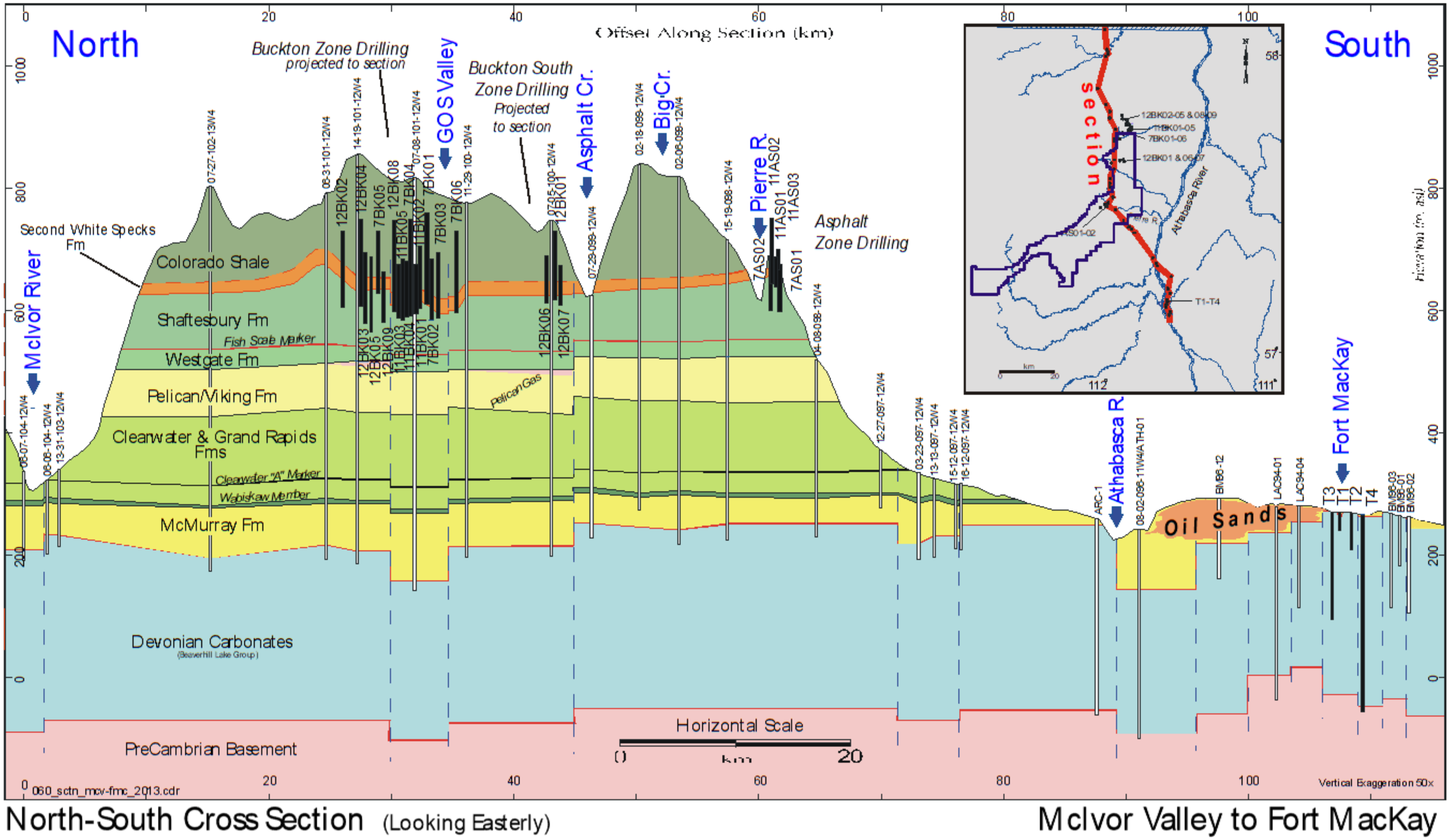
The Pelican Formation (Equivalent to the Viking Formation in the subsurface) has been mapped and sampled in the Birch Mountains at ten litho-sections located along Pierre River, Mid Creek, Asphalt Creek, Buckton

Figure 7.4 Property geology.



Source: After Prior et al. (2013).

Figure 7.5 Cross section of the western portion of the SBH Property.



Source: Sabag (2012)

Creek and Greystone Creek. By far the best litho-section exposures are located in the Asphalt and Greystone Creek valleys. These exposures are characterized by sections of a clean, unconsolidated, medium to coarse grained, well rounded, massive, quartzitic sandstones with minor interbedded shales. The predominance of quartz and its massive appearance are distinctive features which differentiate this Formation from the glauconitic sands of the underlying Clearwater Formation. Based on outcrop and subsurface measurements, the formation has a relatively consistent thickness in the area varying 40-45 m.

The Pelican Formation is poorly consolidated and contains 20–30 m thick sections believed to be channel sands consisting of coarse clean white sand.

The contact between the Pelican Formation and the overlying Westgate Formation shales is typically 5 m thick and consists of interbedded quartzite and mudstone with abundant iron staining which is progressively more pervasive nearer the contact. Minor silicification has been observed at the top of the formation at Greystone-B, and pervasive iron staining along with massive "manganese wad" development has been noted at Mid Creek-B. While no significant geochemical anomalies have been identified in the Pelican Formation, highlights from historical work include two (2) samples from a ±1 m thick shale bed exposed near the top of the Greystone-B litho-section, with 18.7% and 22.7% organic Carbon. Other highlights include up to 10 ppb Au at Asphalt-E, 53 ppm Cu and 43 ppm Co on Asphalt Creek, 153 ppm V at Greystone-B, and 227 ppm Zn at Asphalt-A.

7.2.1.3 Westgate Formation

The Westgate Formation in the area is represented by a handful of poor exposures of badly slumping shales and mudstones which apparently overlie the Pelican Formation and which are devoid of fish debris and can hence be assumed to underlie the Fish Scales Formation. The Westgate Formation has been characterized as a laminated-to-bioturbated, heterolithic mudstone to siltstone that typically contains less than 2% organic Carbon and underlies the Fish Scales Formation (Bloch et al., 1993). Identification of the Westgate Formation from field relationships alone has to date proven difficult due to the lack of a diagnostic lithological break between it and the overlying Belle Fourche Formation, and due to its unconsolidated nature.

The full extent of the Westgate Formation is exposed in the Greystone-B section well to the north of the Property, north of McIvor River, as a massive (20 m) poorly consolidated dark gray mudstone overlying the Pelican Formation. The mudstones are interbedded with thin (<1 cm) discontinuous (10-20 cm long) fine-grained sandstone and siltstone lenses within their uppermost 5 m, and the top of the Westgate Formation is marked only by the sudden appearance of fish scales. Westgate Formation mudstones are frequently iron and sulphur stained, and yellowish sulfates (possibly jarosite) can be seen near its base at the Greystone-B litho-section in abundant irregular 2-4 m long and 1-3 cm wide fractures.

The Westgate Formation is characterized by relatively subdued geochemical variations: V contents range 50-150 ppm and average 115 ppm; Zn contents vary 2-366 ppm and average 89 ppm; Ni contents range 2-186 ppm and average 27 ppm; Au and PGE contents are sporadic; and indicator elements such as Cu, Mo, As and Sb are marginally anomalous.

7.2.1.4 Fish Scales/Belle Fourche (Shaftesbury) Formation/Member

The Fish Scales Formation (also known as the Shaftesbury Formation or the Shaftesbury Shale on the Property) is normally characterized as a fish scales-bearing mudstone or claystone, with minor associated sandstones and conglomerates, with up to 8% organic Carbon (Bloch et al., 1993). The Shaftesbury Formation is defined as the stratigraphic interval from the base of the Fish Scales bearing section to the base of the Second White Specks section which includes the Fish Scale and Belle Fourche Formations of Bloch et al. (1993). In Northwestern Alberta, the Fish Scales Member is hosted within the Shaftesbury Formation which is roughly equivalent to the Belle Fourche, Fish Scales, and Westgate Formations of Northeastern Alberta (Alberta Geological Survey, 2019).

The Fish Scales bearing section is marked by the sudden appearance of fish scales and other skeletal debris in an otherwise massive unit of silty shales and mudstones, representing a conspicuous marker bed - the Fish Scales Marker Bed (FSMB). The FSMB, described in sections from the Peace River area as a coarse-grained sandstone with large concentrations of fish debris surrounded by organic Carbon-rich shales, is noticeably absent in the Birch Mountains where it is proxied for by fish scales bearing black shales.

Exposures of the FSMB are rare in the area and have been positively identified only at Greystone-B, although other occurrences have also been noted in badly slumped exposures along Asphalt Creek. At Asphalt-F, a section of the Creek is characterized by the presence of an unusual abundance of friable float slabs and blocks up to 5 cm thick, composed of a concentrated bed of fish scales (>80% by volume), at an elevation of approximately 530 m, consistent with Projected FSMB exposure per oil well picks compiled in the subsurface stratigraphic drilling database. The exposure is located well away from exposures of the overlying Second White Specks Formation. Samples of this material are characterized by up to 5% P; 16% Fe; by slightly elevated base metal concentrations; by elevated Pt, Pd, Mo, As and Sb; and 20 ppb and 17 ppb Au.

Lithogeochemistry of the FSMB, to the extent represented by the scant surface sampling collected throughout the Birch Mountains, shows it to be a potential trap for metals with an apparent correlation between the better metal contents with the higher total organic carbon (C-org) content of samples. While the samples indicate that the formation is enriched in metals relative to underlying units, U and Th concentrations are surprisingly low and insufficient to produce the typical radioactive anomaly characterizing the FSMB picks in oil well down-hole geophysical logs. U and Th concentrations average only 10.2 ppm and 9.9 ppm, respectively, and only 3 of 57 historical samples collected report U exceeding 50ppm. Drillhole intercepts incidentally cored at the end of all historical drillholes over the Property have reported grades similar to the Speckled and Labiche Shales above it (lower base metals than Speckled Sh), but typically higher grades of Li-Sc especially from areas midway over the Property (e.g.: Pierre River, Asphalt Creek areas).

Geochemically significant anomalies from the FSMB have been identified at the Greystone-C exposure, near the McIvor River well to the north of the Property, reporting upward to 10.5% C-org, 117 ppm Cu, 228 ppm Ni, 942 ppm V, 761 ppm Zn, and 12 ppb Au. While very anomalous relative to other samples from the FSMB within the region and those from all other Formations, the exposure may be material slumped from the overlying Second White Speckled Shale Formation.

The presence throughout certain localities in the Birch Mountains area of spherical and quasi-spherical carbonate concretions ranging in size upward to 2 m spatially associated with the FSMB may be significant. The concretions consist predominantly of black calcite with considerable sulphide mineralogy as disseminations of predominantly FeS and as pyrite nodules ranging in size upward to 5 cm, consisting of aggregations of crystalline grains. In addition, the presence of concretions typically characterizes all exposures located by tracing sulphide-rich alluvial material upstream, especially those carrying also alluvial gold. By far the best location to observe the carbonate concretions is KRC-B wherein gravel bars along the KRC tributary to the McIvor River host countless carbonate concretions surrounded by alluvial material consisting of upward to 50% sulphides. Carbonate concretions can also be seen at the Greystone-B litho-section, strewn about in slumped shales and muds carrying also considerable pyrite nodules.

Short random length drill core intercepts and related analytical data of Belle Fourche (Shaftesbury) Shale at the end of many holes drilled primarily to characterize the overlying Second White Speckled Shale by Tintina Mines Ltd. (Tintina) and DNI. The limited information serves to show that at least the uppermost 10-20 m are metals enriched, notably in REE-Li-Sc. Comparative grades show it to be as well mineralized in base metals as the Lea Park Formation but less so compared to shales from the Second White Specks Formation. The Belle Fourche (Shaftesbury) Shale, however, in most drill intercepts better grades for Li-Sc than the overlying Second White Specks and the Lea Park (Labiche) shale above it.

7.2.1.5 Second White Specks Formation

The Second White Specks (Speckled) Formation is described by Bloch et al. (1993) from outcrops in the Peace River area of northwest Alberta and from sub-surface data from around the Alberta Basin as consisting of a calcareous shale or siltstone with organic carbon rich shales commonly associated with a bentonite up to 20 cm thick, in turn associated with a carbonate concretionary layer. With the possible exception of an abundance of carbonate matrix, the Second White Specks Formation has been identified at many exposures throughout the Birch Mountains, and it is relatively well exposed in the creeks and rivers. The Second White Specks has been mapped and sampled at exposures between the 600 m and 650 m elevations above sea level (masl) along Mid, Asphalt, Gos, Greystone, and Current Creeks.

Asphalt-H, located toward the headwaters of Asphalt Creek, represents an excellent and typical section of the Second White Specks Formation in the area, consisting of a succession of lithologies commencing at the bottom with a Siliciclastic Bone Bed (SBB) characterized by a coarse grained, sub-rounded, poorly sorted, carbonate cemented, black chert and glassy quartz sandstone, which often contains large concentrations of fish debris. A thin, 10-20 cm thick, carbonate concretionary unit overlies the SBB (normally within ±1 m), and is itself overlain by bentonite or a zone of bentonitic – rich shale.

At Asphalt-H, a distinct zone of bentonites is evident immediately above the SBB, continuing for 3-5 m up-section, in which the thicker bentonite seams are, upon close inspection, seen to be composed of countless thin bentonite layers in a 15-20 cm zone. The bentonite layers are intercalated in a shale matrix with variable C-org content ranging from trace upward to 29% (avg 3%). Calcareous shales are patchy at Asphalt-H, although several sections were found to contain white specks or coccoliths and fossils such as fish debris including teeth (shark?), bivalve coquina, and Inoceramus imprints.

Whereas the SBB in the area typically varies in thickness 10-20 cm, it attains a thickness exceeding 1 m at the Gos-C litho-section exposure, near the Buckton Zone, wherein it is also associated with metals enrichment in surrounding shales (Gos-C is at the eastern flank of a principal stratigraphic disturbance in the area). It is of note that SBB has been documented in the area from several elevations varying 600-640 masl, and that the variations are probably the result of multiple slumping. Repetitive sedimentary/extinction events cannot be entirely ruled out.

Samples of the Second White Specks Formation have to date reported by far the most anomalous concentrations of base as well as precious metals from the Birch Mountains, in addition to yielding native gold grains from certain localities (e.g. GOS1 gossan, Gos Creek-C and Current Creek). Geochemical anomalies identified from the Formation define relatively systematic base metal enrichment zones, dominated by Ni-Cu-Mo-V-Zn (±U-Co-Cd-Ag-Au), spatially associated vertically with the more carbonaceous sections immediately overlying the SBB, and a suggested lateral association with proximity to certain faults in the Birch Mountains. Many intraformational geochemical inhomogeneities notwithstanding, Asphalt-H, GOS1 and Gos-C present by far the best metal enriched locations documented from the Second White Specks Formation in the area.

7.2.1.6 Lea Park (Labiche) Formation

The Lea Park (Labiche or Colorado Shale) Formation, overlying the Second White Specks (Speckled) Formation is poorly studied given lack of exposures in the area and in the Birch Mountains. Much of what is known is derived from review of drill cores from historical drilling completed by Tintina and DNI. This Lea Park (Labiche) Formation is locally eroded due to periods of uplift. Its thickness varies significantly (approximately 15-150 m) from location to the next based on downhole geophysical logs from oil/gas drilling in the area.

Two small and badly slumping outcrops of massive gray Lea Park Formation shale previously observed well above those of the Second White Specks Formation have been assumed to represent Lea Park shales and the youngest Cretaceous strata preserved in the Birch Mountains area of Northeast Alberta.

Due to its monotonous lithology and chemistry, the Lea Park Formation shales have historically attracted little attention and throughout much of the exploration history over the Property were regarded as waste cover rocks above the better mineralized Speckled Shale. Given the discovery and recognition of recoverable base metals within the Lea Park Formation, and the presence of equally good, or better, grades of REE (±Li-Sc) compared to the underlying Second White Speckled Shale, the Lea Park Formation attracted renewed attention as a target of merit during the most recent DNI work on the Property.

7.3 Black Shale Classification

Black shale is a black, organic-rich, non-bioturbated, fine-grained (silt-sized or finer) and commonly laminated sedimentary rock composed dominantly of clay, quartz, organic matter and variable amounts of sulphide minerals (mostly pyrite) that formed in anoxic and euxinic environments (Swanson, 1961; Vine and Tourtelot, 1970; Tourtelot, 1979; Huyck, 1989).

Most shale that meets the 'black' shale colour criteria contains elevated organic carbon; however, the amount of total organic carbon necessary to satisfy the black shale definition varies. For example, Huyck (1989), Tourtelot (1979) and Weissert (1981) define the organic carbon component of black shale as having >0.5%, 1-10% and 1-30%, respectively, and Huyck (1989) acknowledged that problems exist with setting an arbitrary lower limit for black shale organic carbon content.

The emphasis of the colour black can also be a poor discriminator since the color is essentially controlled by the relative rates of organic versus non-organic sedimentation. Therefore, it is possible to have grey shale that formed in a reduced seafloor environment where the biological productivity was low and the non-organic sedimentation rate was high (W. Goodfellow, personal communication, 2013). In addition, 'black' shale could contain less organic matter than 'dark-grey' shale such that the total organic carbon content is not that useful in constraining the redox conditions in the lower water column.

Because of the ambiguities in black shale characterization, Huyck (1989) suggested that the basic shale description include location, stratigraphic position, scale of variation, regional distribution, thickness, sedimentary facies, paleontology, depositional environment, petrography, texture, fabric, color, mineralogy, weight percent organic carbon, weight percent carbonate carbon, weight percent sulphide sulphur, degree of pyritization, and type and maturity of organic material. Because this level of information is often beyond the means at our disposal for rock description, the abstruseness of black shale definition was discussed by U.S. Working Group IGCP 254 members who formerly proposed the following definition, which is outlined in Huyck (1989):

"A black shale is a dark (gray or black), fine grained (silt sized or finer), laminated sedimentary rock that is generally argillaceous and contains appreciable organic carbon (>0.5 wt %)."

The term "laminated" in the definition of black shale is important because it further delimits the minimum organic carbon content at the time of sediment deposition. Laminations in Phanerozoic shale require a lack of significant bioturbation creating conditions that are too hostile to support burrowing fauna. Such conditions, whether due to insufficient oxygen in the bottom water, excess salinity or other factors, promote preservation of organic matter (Huyck, 1989).

With respect to "metalliferous black shale", the metal values are highly variable for different shale sequences (and within the shale package). These variations essentially reflect the concentration of reduced biogenic sulphur in the water column (euxinic versus anoxic) and the availability of metals to precipitate sulphides. In the case of reduced water columns, there is usually excess biogenic sulphur but limited contents of metals such as Fe, Zn, Cu, Ni, etc., such that the main sources of metals must therefore include some input of clastic sediments and/or episodic hydrothermal fluid discharges into the sedimentary basin.

In addition to providing a formal definition for black shale, the U.S. Working Group IGCP 254 members also revised the definition of a metalliferous black shale as follows (Huyck, 1989):

"A metalliferous black shale is a black shale that is enriched in any given metal by a factor of x2 (except Be, Co, Mo, U for which x1 is sufficient) relative to U.S. Geological Survey standard SDO-1."

Based on the definitions and criteria outlined in Huyck (1989), the Second White Specks Formation meets the textural and compositional criteria of metalliferous black shale. The Second White Specks shale is black, laminated, fine grained, argillaceous sedimentary rock that contains appreciable organic carbon (averages 8.0 wt. %; n=506). Based on a geochemical dataset of over 500 analyses, shale horizons within the Second White Speckled Shale have 'maximum' enrichment factors of >2 times the U.S. Geological Survey standard SDO-1for the following metals: Ni (4.2 times SDO-1), Mo (2.7 times SDO-1), Co (3.9 times SDO-1), Cu (2.4 times SDO-1), Zn (12.6 times SDO-1), U (5.3 times SDO-1), V (8.8 times SDO-1), Li (6.4 times SDO-1), Th (4.1 times SDO-1), Sc (2.2 times SDO-1) and REE (6.9 to 13.6 times SDO-1).

The Lea Park (Labiche) Formation black shale is not as easy to classify in comparison to the Second White Speckled Shale. The Lea Park Formation has an average organic carbon content of 1.1 wt. % (n=544), which qualifies the Lea Park as black shale; however, other criteria do not support a black shale designation. Mainly, the Lea Park is a well bioturbated, light to medium grey shale unit. The colour and general non-laminated texture, in particular, suggest that the Lea Park is not a black shale sensu stricto. In addition, the grey bioturbated Lea Park shale has horizons with thin, graded siltstone beds and sedimentary structures such as ripple marks that are indicative of gradual coarsening upward cycles and shallowing stream beds that are counterintuitive to anoxic and euxinic redox conditions in the lower water column.

The Lea Park Formation contains lower concentrations of traditional metals when compared to the Second White Specks shale. Accordingly, the Lea Park Formation has attracted little historical exploration attention. It should be noted that some metals within Lea Park shale horizons have 'maximum' enrichment factors that are >2 times the USGS standard SDO-1; these include: Zn (4.5 times SDO-1), Th (3.9 times SDO-1), Li (4.1 times SDO-1), V (4.6 times SDO-1) and REE (2.1 to 2.8 times SDO-1). The extractability of these metals by bulk bio-heap leaching techniques as demonstrated by DNI's recent work in 2013/2014 compelled DNI to evaluate the potential of the Lea Park Formation as a host to metallic mineralization (Puritch et al., 2014).

7.4 Mineralization

The three known black shale polymetallic mineralized zones on the Property are: the Lower Buckton Zone, the Buckton South Zone and the Asphalt Zone (Figure 7.4). Mineralization in these three zones consists of stratabound polymetallic enrichment of Mo-Ni-U-V-Zn-Cu-Co-Ag-Au plus REEs-Li-Sc-Th, hosted in a continuous 100-150 m thick "package" of flat-lying black shale formations. Mineralization is hosted in the Second White Specks Formation shale, the overlying Lea Park (Labiche) Formation shale, and the Fish Scales/Belle Fourche (Shaftesbury Formation Shale) Formation respectively. Although the Second White Specks Formation shale is more enriched in base metals grades, all three formations have significant REE content, and elevated Li-Sc in the Fish Scales/Belle Fourche (Shaftesbury Shale) Formation in Northeastern Alberta. Mineralized formational thicknesses for the three black shale formations are presented in Table 7.2.

Table 7.2 Mineralized formational thicknesses for the Lower Buckton, Buckton South, and Asphalt zones.

Mineral Zone	Formation	Thickness (m)
Lower Buckton	Labiche	100.27
Lower Buckton	Second White Specks	22.55
Lower Buckton	Shaftesbury (Maximum Intercept)	2.45
Buckton South	Labiche	16-62
Buckton South	Second White Specks	11-26
Buckton South	Shaftesbury (Maximum Intercept)	18.77
Asphalt	Labiche	8-22
Asphalt	Second White Specks	6-13
Asphalt	Shaftesbury (Maximum Intercept)	58

*The Shaftesbury was not drilled through, so the maximum intercept length is presented as its thickness.
Source: APEX (2025)

Previous exploration programs targeted the Second White Specks (Speckled) Formation shale and the overlying Lea Park (Labiche) Formation shale and only incidentally intercepted the Fish Scales/Belle Fourche (Shaftesbury) Formation in the bottom of drilling. Therefore, the Fish Scales/Belle Fourche (Shaftesbury) thickness is unknown in most of the historical drilling. All thickness cored are mineralized equal or better than the Labiche Shale.

These formations extend over 20-30 km^2 if not hundreds of km^2 each and represent excellent lateral continuity per drilling of 100's of oil/gas well over the area. Good lateral grade continuity has also been demonstrated by historical drilling over the 35 km distance across the north part of the Property. Mineralization in the Buckton South Zone is open for at least 6 km to its north, west and the south, and portions of its extensions are exposed in litho-sections in valley walls of Asphalt Cr. And Big Cr. Mineralization in the Asphalt Zone is open for at least 8 km to the west, north and south and is exposed in both the Pierre River and Mid Cr. Valley walls.

Mineralization in the Lower Buckton Zone is part of the greater historical Buckton Zone with a historical Mineral Resource calculated in 2013 (Eccles et al., 2013c; Puritch et al., 2014; see Section 6.2). In 2021, all of the lands from the north of the 26th Line representing the boundary between Twps 100 and 101, were designated conservation lands by the Province of Alberta, including approximately 87.1% of the historical Buckton Deposit. Approximately 12.9% of the historical Buckton Deposit currently lies on the SBH Property and is included herein as part of the Lower Buckton Mineralized Zone. This zone, however, remains open to the south and to the west.

Overburden encountered in drilling, often consisting of glacial till covering the uppermost Lea Park Formation, ranges from 6-82 m thick on the Property.

Earlier historical work relying on traditional mineral identification noted that most of the metals, were initially believed to occur principally in the fine and coarser sulphides distributed throughout the black shale, which can constitute as much as 20% of the shale matrix by volume, but typically range 5%-20%. Subsequent work suggests that much of the metals content is associated with clay mineralogy within the black shale, and its mineral (Micro Scaled Mineral or MLA) study suggested that at least a portion of the metals occur in readily soluble ionic form rather than as discrete minerals. The foregoing are conclusions also shared by leaching test work conducted by AITF and Canmet (Puritch et al., 2014).

8 Deposit Types

8.1 Metalliferous Black Shale Deposits

The term “black shale” is a common expression to describe dark-coloured, fine-grained sedimentary rock that is relatively rich in organic matter (between 1% and 30% organic carbon and is commonly 5% or more organic carbon; (e.g., Weissert, 1981). Black shale is generally regarded to have been deposited within anoxic deep water depositional environments (500-900 m depth; oxygen minimum zone), although they can be formed in a broad variety of depositional environments ranging from fresh to estuarine to marine waters with conditions ranging from anoxic to oxic (Quinby-Hunt and Wilde, 1996). Black shale deposition has occurred throughout the geological record, but the Cretaceous Period contains the most extensive record of black shale formation in both shallow-water and deep ocean localities (e.g., Arthur and Schlanger, 1979).

Black shale metal deposits worldwide represent important hosts for a variety of economic interests, including sources for hydrocarbons and organic compounds, graphite deposits, and as sources of base metals, precious metals, trace metals and rare-earth elements.

The origin of metals in metalliferous black shale has been debated for decades. Although many different sources for the metals and modes of their enrichment have been suggested, general consensus suggests a combination of processes and sources often act in concert: syn-sedimentary metalliferous enrichment by hydrothermal fluid and/or hydrogenous sequestration/deposition via seawater where upwelling nutrient-rich seawater associated with a hydrothermal plume deposits metals in the black shale and related phosphorite. Some other theories involve proximity to submarine volcanism, bacterial sulfate reduction, diagenesis and/or low-grade metamorphism, recrystallization and remobilization processes, and epigenetic emplacement.

Black shale metal deposits are typically polymetallic with a variable proportion of sulphide minerals. Their exploitation on large scale has been hampered by the inefficiency of conventional metallurgical processing (smelting) for recovery of valuable contained metals on a collective basis and the environmental impact and energy costs of the application of the conventional techniques. By far the biggest challenge to extraction of metals from black shale has been morphology of the metal-bearing compounds that are typically dispersed throughout the shale as very fine particles and are often trapped in the organic and fine clay components of the shale. Milestone advances during the past decade in application of industrial scale bio-leaching to extraction of metals from polymetallic black shale on a collective basis significantly enhances prominence of this deposit type worldwide.

Metal-rich black shale is the most common type of shale-hosted metal deposits. Black shale deposits worldwide have long been known to be enriched with a variety of transition metals, especially U, Mo, Zn, Ni, Cu, Cr, V, Co, Pb, Mn, W, Sb and other elements (Vine and Tourtelot, 1970; Pašava, 1996). In some black shale, significant enrichment of noble metals (gold and platinum group elements) is known (e.g., Yermolayev, 1995). Black shale has also been associated with REE- and U-enrichment, particularly within phosphate-enriched black shale sections (e.g., Yangtze Platform, China; Jiang et al., 2007).

Major base metal deposits occurring in black shale occur in the Proterozoic of Australia (e.g., Mt. Isa, Hilton, McArthur River), North America (e.g., White Pine in Michigan and Sullivan in British Columbia) and Africa (e.g., Zambian Copper Belt). Few black shales have been commercially exploited on a large scale, though many have been sporadically mined on a local scale and are associated with other deposits or mining camps often with an affinity to large metal-bearing geological systems.

The uraniferous Alum Shale, Sweden, and the polymetallic Talvivaara black shale (metamorphosed to black schist) hosted deposit, Finland, provide examples of active black shale exploration and development operations. The Talvivaara deposit reached production in October 2008 and currently represents the only current active mining operation that is producing black shale hosted polymetals relying on bulk mining and bulk bio-leaching techniques.

Situated in the Early Proterozoic Kainuu schist belt, the Talvivaara deposit is hosted by metamorphosed black schist. The black schist is characterized by higher Al, Au, B, Ba, Fe, Hg, K, Li, Mo, Na, Pd, V, Zr, and rare-earth element (REE) concentrations and by lower Ca, Mg, Ag, and F values compared with its intercalated black calc-silicate horizons. Geochemical evidence for hydrothermal influx at Talvivaara includes elevated Ni, Cu, Zn, and Mn values relative to other Finnish and North American black shale.

The origin of REE accumulation in the Lea Park (Labiche), Second White Specks and Shaftesbury is not known with certainty.

Based upon a wide variety of compelling geological and geochemical evidence, including numerous bentonite and/or bentonitic layers, barite and possible phosphorous nodules, polymetallic enrichment of the Second White Specks, Labiche, and Shaftesbury shales in the SBH Property area is thought to be associated with hydrothermal-type mineralization (e.g., Dufresne et al., 2001; Dufresne et al., 2011; Eccles et al., 2012a, b; Sabag, 2010, 2012). The hydrothermal mineralization is speculated to be associated with black-smoker-type hydrothermal vents. Several localized thickenings of the Shaftesbury Formation in the Property area are hypothesized to be related to these potential black-smoker vents. These thickenings have been identified in subsurface stratigraphy in hundreds of oil and gas wells and present potential metal enrichment zones to be tested with future exploration programs.

A depositional time gap, which is estimated to span 4 to 8 million years (Dufresne et al., 2001), exists between the Second White Specks and the Late Cretaceous Lea Park (Labiche) shales and may be temporally associated with extensional tectonics and kimberlite emplacement in the Buffalo Head Hills and nearby in the Birch Mountains (i.e., foreland bulge; Eccles, 2011).

The Birch Mountains area encompassing the SBH Property has been intruded by ~78-72 Ma kimberlite to alkaline (kimberlite-like) intrusive bodies that comprise evolved magmas enriched in LREE, carbonate and late-stage mineral assemblages for these types of rocks including apatite (Eccles, 2011). Resedimented kimberlitic material has been previously described particularly within the Second White Specks Formation (Dufresne, 1999; Dufresne et al., 2001).

Beneath the sedimentary rocks of the Western Canadian Sedimentary Basin, the SBH Property area is underlain by a narrow (150-200 km wide) of 1.99–1.93 Ga granitoid rocks known as the Taltson Magmatic Zone, which includes metaluminous to moderately peraluminous, and moderate to strongly peraluminous granitoid rocks (e.g., Bostock et al. 1987, 1991).

Consequently, broad-spectrum hypotheses of REE-enrichment for the Late Cretaceous black shale paragenesis in the Birch Mountains could involve metal contribution from alkaline volcanism, A-type granite, nutrient-rich seawater (hydrothermal plume), or any combination of these potential sources.

Given REE-enrichment in the Lea Park (Labiche) and Second White Specks Shale Formations, and the ease with which they are extracted from the black shale as co-products to extraction of the polymetals as demonstrated by DNI's historical bio-leaching test work, DNI broadened the scope of its exploration focus to assess the potential of the shales as a long term source to REEs alongside their potential for hosting more traditional polymetals.

Similarities between the SBH Property and Chinese ion-adsorbed REE deposits have been suggested by some of DNI's work in 2012 (e.g., Eccles et al., 2012a). Economic ion-adsorption REE deposits in China were recognized as residual deposits of REE-bearing clays. These deposits are associated with weathered REE-enriched granites in the Jiangxi Province of Southern China. Rare-earth elements released during granitic weathering (i.e., feldspar breakdown) are adsorbed by clays such as halloysite and kaolinite. A primary example includes the Longnan deposit in China where REE-enriched clays range from 3-10 m thick, have generally low grade (0.03-0.35 wt.% total REO; Grauch and Mariano, 2008), are divided into layers based on clay mineralogy, and are exploited economically because it is relatively easy to extract REE. Under the right conditions of ion concentration, ionic strength, pH and cohesive energy density of the mineral sorbate, liberated REE could form adsorption bonds with black organic-rich shale of the Second White Speckled Shale creating a similar REE ion-adsorption environment to those deposits in Southern China

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9 Exploration

Exploration by CMAI at the SBH Property from 2022 to the Effective Date of this Report consisted of data compilation, LiDAR (light detection and ranging) imagery interpretation of portions of the Property, a B-zone soil sampling program, a bulk sampling program, and the calculation of conceptual exploration targets.

The data compilation exercise was conducted for the entire Property and LiDAR data was purchased over the northern portions of the Property over the Lower Buckton, Buckton South, and Asphalt areas. Historical oil and gas log data was summarized for areas around the SBH property and upper contacts for the Second White Specks and the Shaftesbury formation were modelled across the Property in an updated Stratigraphic Study.

The conceptual exploration targets are summarized in Section 10.

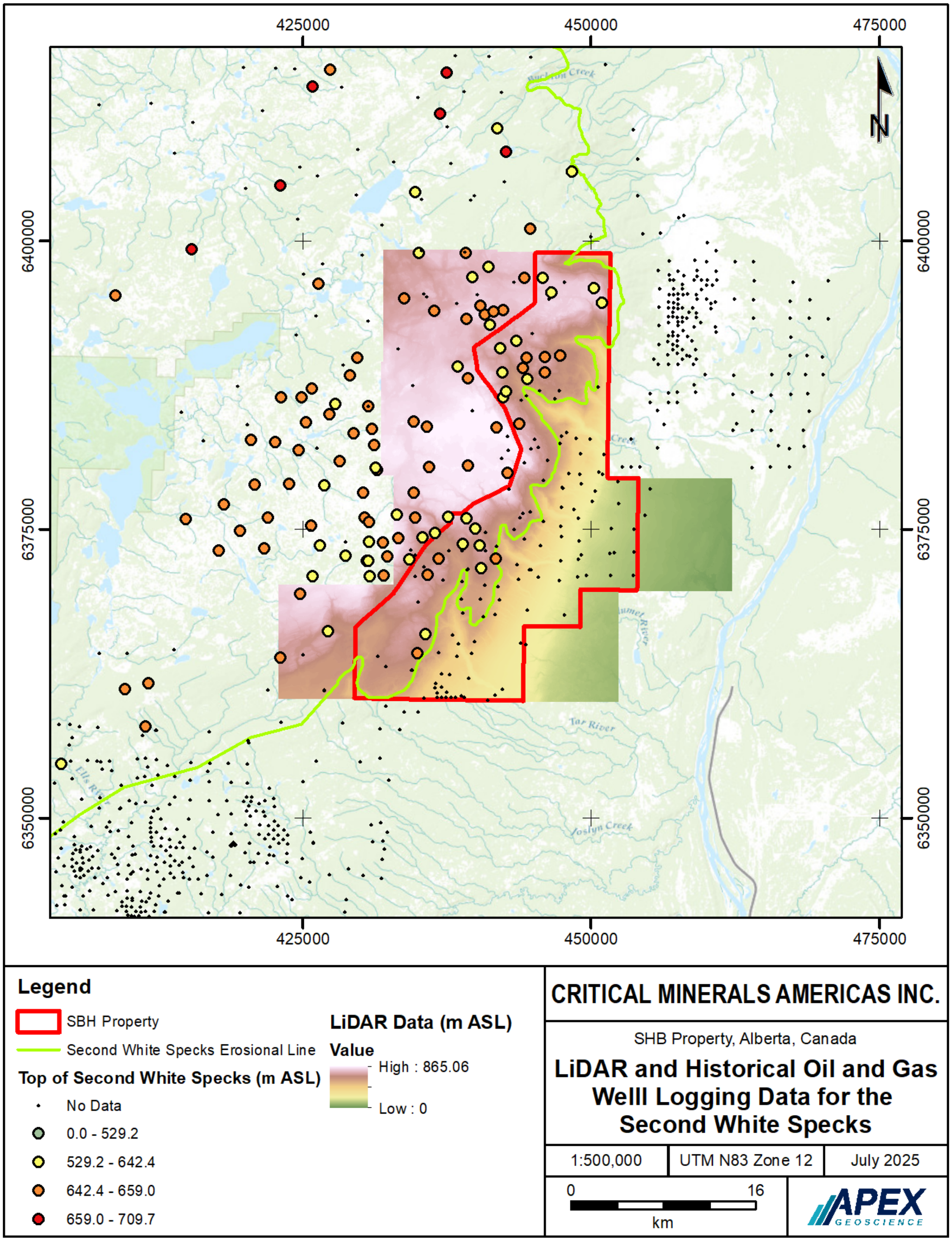
9.1 Data Compilation

In late 2022, CMAI commissioned APEX Geoscience Ltd. (APEX) to conduct data compilation of historical oil and gas wells on the Property in order to modernize the Stratigraphic Framework for the Project. For the sake of this report diamond drilling is referred to as “diamond drillholes” or “drillholes” and oil and gas drilling is referred to as “oil wells” or “wells”. Historical oil and gas well formational logging data was downloaded from the Alberta Energy Regulator (AEG) website. Some of the well data had formational information and this information was compiled into an oil and gas well database including the formation tops, bottoms, and thicknesses calculated for each well within and proximal to the SBH Property (Figure 9.1). Most of the newly added drilling data was located in the southern portions of the Property and did not show the formations of interest (i.e., Labiche, Second White Specks, or Shaftesbury formations) or had no formational logging data.

9.2 LiDAR Imagery

Airborne LiDAR DEM imagery was purchased by CMAI over the northern portion of the Property covering approximately 946 km2 over 10 townships from Altalis Ltd. Surface resolution for the data is 30 cm vertical by 50 cm horizontal accuracy. LiDAR data was used to model a revised digital terrain surface model as well as revise the elevation of historical oil well and historical diamond drill collars to model the Labiche, Second White Specks, and Shaftesbury formations. The newly purchased LiDAR data covers the Lower Buckton, Buckton South, and the Asphalt areas of the SBH Property (Figure 9.1).

Figure 9.1 LiDAR data, historical oil well logging of the Second White Specks Formation, and the erosional extent of the Second White Specks Formation.



9.3 Enzyme Leach B Zone Soil Sampling

In September 2023, APEX on behalf of CMAI, completed an enzyme leach B zone soil sampling program at the Property. The program was designed to verify historical results, expand on known mineralization to the south and adjacent to the Asphalt Mineralized zone, and assess the potential for polymetallic and REE mineralization. Several anomalies were also investigated, including a 4x7 km elliptical subsurface stratigraphic anomaly and PDS1 aeromagnetic anomalies.

A total of 102 soil samples, including 7 duplicate samples, were collected for geochemical analysis. The soil sample grid was designed with 500 m sample spacing and 1,000 m line spacing with six 9-km traverses. The soil grid covered portions of the historical B zone sampling programs at Asphalt to compare the historical data to new analytical results. The 2023 grid also covered portions of historical Demofrac soil anomalies and historical isopach thickening anomalies or "domes" in the second White Specks Formation. Soil lines were oriented 133°-227°, roughly perpendicular to the eastern erosional edge of the Birch Mountains. Duplicate samples were taken approximately every 20 samples and consisted of material extracted from the same horizon from the same sample hole.

The samples were analyzed for 66 elements using 7-ESE-Enzyme Selective Extraction and QOP Enzyme (Enzyme Selective Extraction Inductively Coupled Plasma – Mass Spectrometry (ICP-MS)) methods by ActLabs (Activation Laboratories Ltd.) of Ancaster Ontario. ActLabs in Ancaster is ISO/IEC 17025:2017 accredited and ISO 9001:2015 certified and is independent of the Authors, APEX, and the Company.

The 2023 soil sample results revealed anomalous Ni and other metals scattered throughout the area, with small clusters of higher-grade values on the eastern and south-western portion of the grid (Figure 9.2). Nickel serves as a good proxy for most other anomalous metals, so it is the primary focus of this analysis. Of the 102 samples collected, 18 soils returned > 100 ppm Ni, and one sample returned 313 ppm Ni.

The soil sampling program was successful in identifying a reliable representation of anomalies in the area when compared to historical results. The 2023 B Zone soil sampling delineated geological anomalies as well as a thickening isopach anomaly (dome) at the Second White Specks (Sabag, 2024). Some of the anomalies are interpreted as Diffusion or Oxidation Suite anomalies which lie in areas over the erosional edge of the Second White Specks Shale, or below it, and may well reflect some intermingled hydromorphic component from adjacent slumping debris, although the overall correlation of these anomalies is with redox diagnostic cells, their magnetic expression and an overall correlation with north-northeast trending structures across these areas argues in favour of a local buried provenance.

9.4 Bulk Sampling

In September 2023, APEX on behalf of CMAI, completed a bulk sampling program at the Property. The 2023 bulk sampling program was intended to collect large-volume rock samples from the Labiche (Lea Park), Second White Specks and Shaftesbury (Belle Fourche) formations for bioleaching and metallurgical test work, and to produce standard reference material (SRM) for future drill programs. Most of the samples were collected from outcrop exposures with minimal chemical weathering and obvious slumping in areas that were accessible by helicopter. A total of 56 - 20 L pails of black shale material s were collected from outcrop exposures by channel sampling. The 2023 bulk sample locations are shown in Figure 9.3 with additional information provided in Table 9.1. Schematic cross sections of the outcrops sampled are provided in Figures 9.4 to 9.6.

Figure 9.2 2023 B Zone soil sampling geochemical results for nickel.

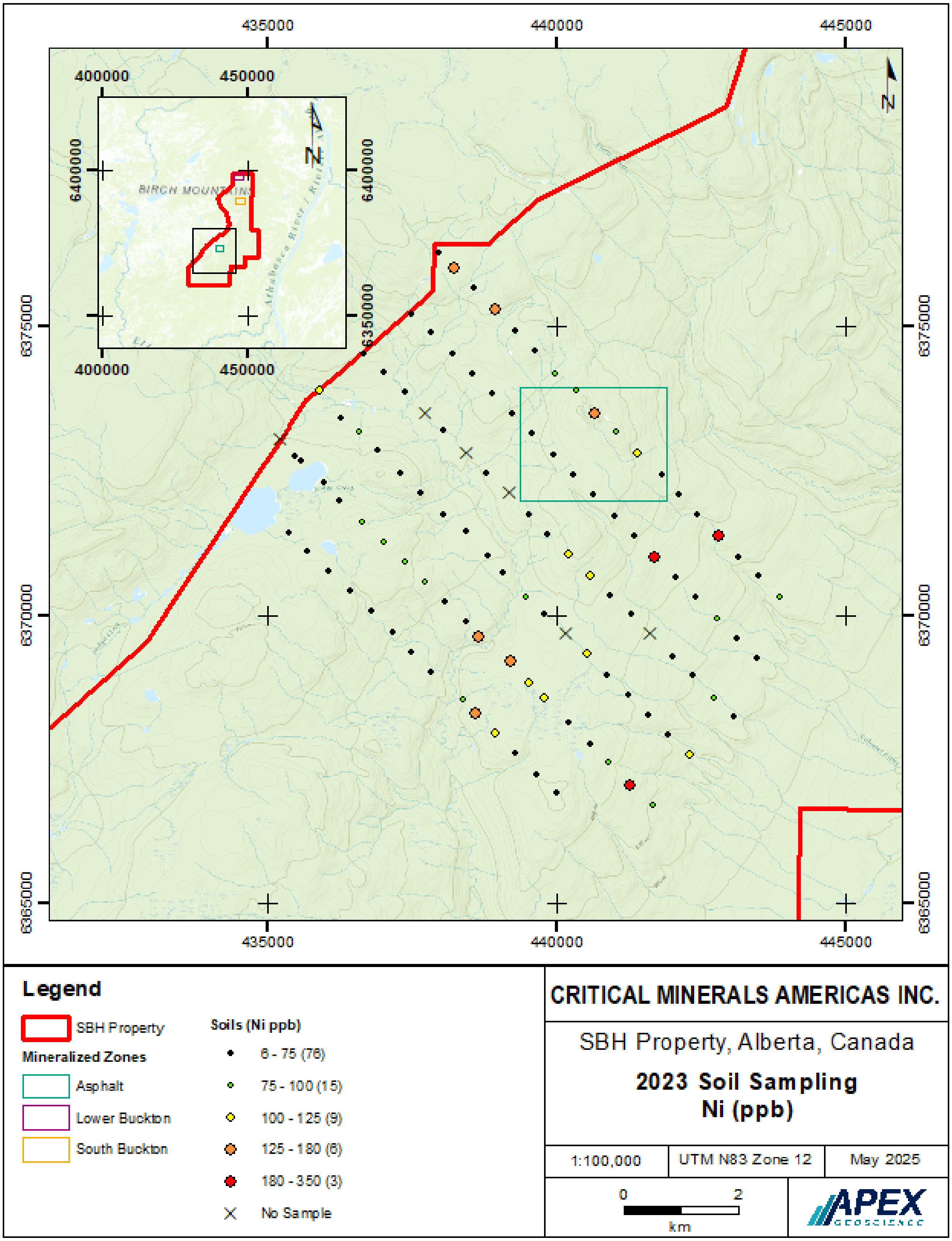


Figure 9.3 Bulk sample collection locations.

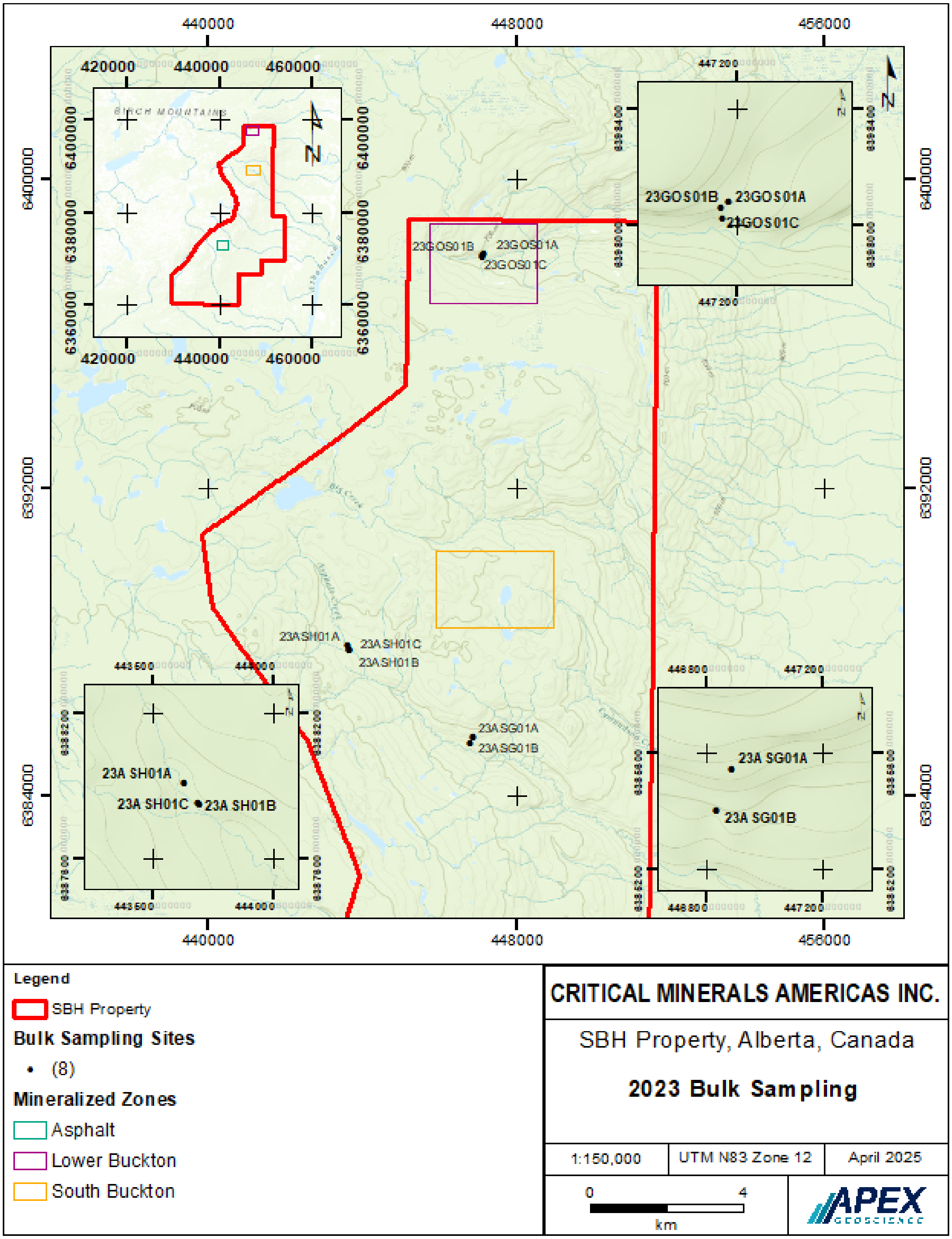
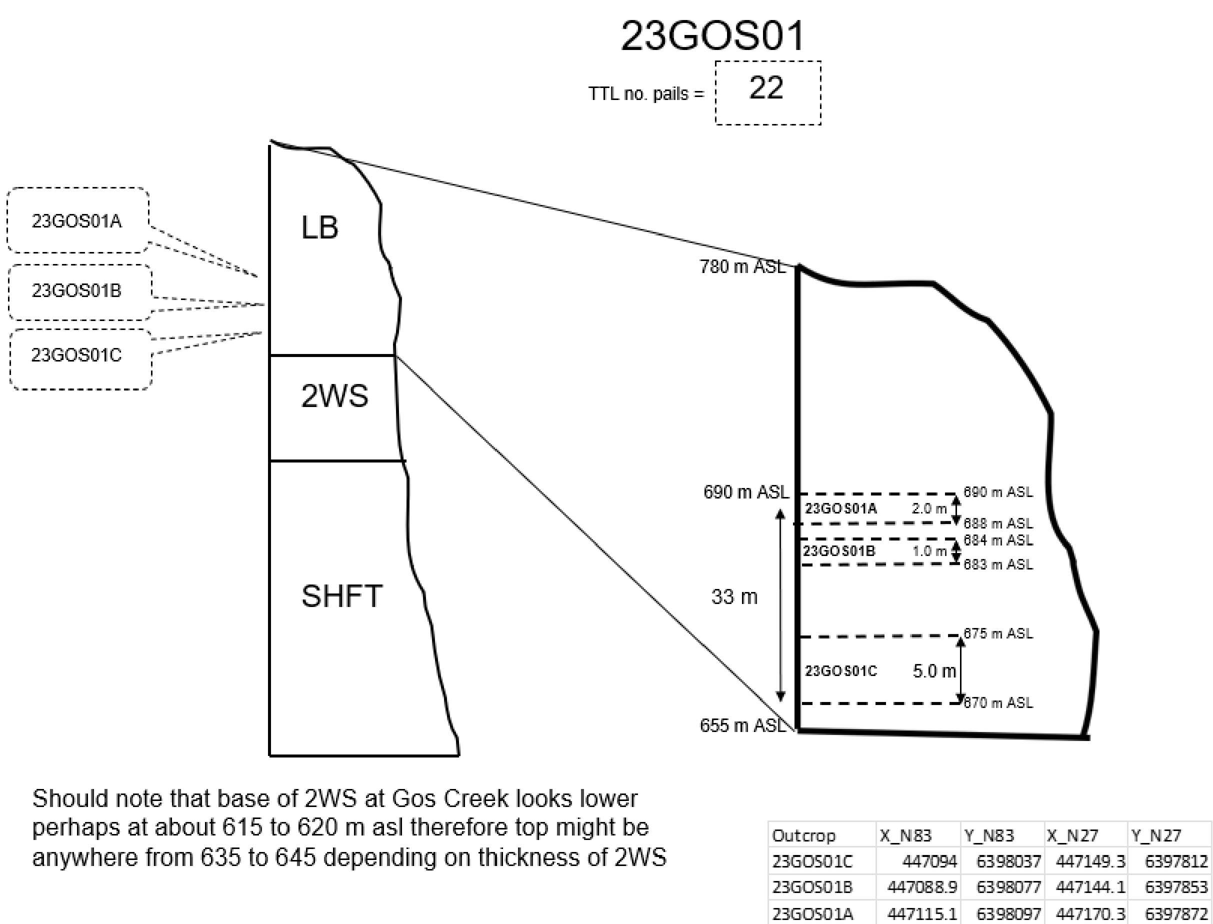


Table 9.1 2023 CMAI's SBH Bulk Sampling Program Summary.

Work Type	Location	Site ID	Pail Numbers	Number	Weight (kg)
Bulk Sampling Program	Second White Specks	23ASH01	23ASH01A to L	11	224.05
	Labiche (Lea Park)	23GOS01	23GOS01A to U	21	360.96
	Shaftesbury (Belle Fourche)	23ASG01	23ASG01A to U	21	402.41
	Subtotal			53	987.42
Standard Reference Material	Second White Specks	23ASH01	23ASH01V	1	18.76
	Labiche (Lea Park)	23GOS01	23GOS01V	1	19.19
	Shaftesbury (Belle Fourche)	23ASG01	23ASG01V	1	17.06
	Subtotal			3	55.01
TOTAL				56	1042.43

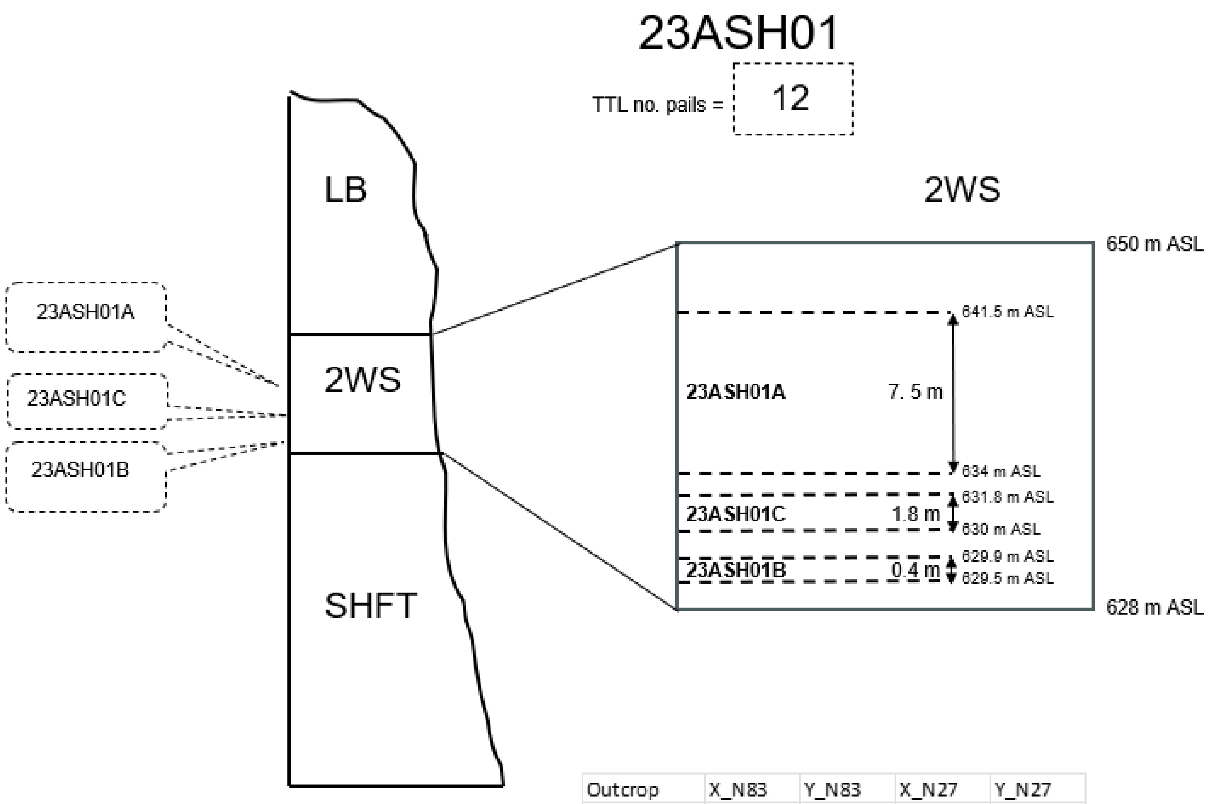
Source: APEX (2025)

Figure 9.4 Bulk sample proportions for 23GOS01.



Source: APEX (2025)

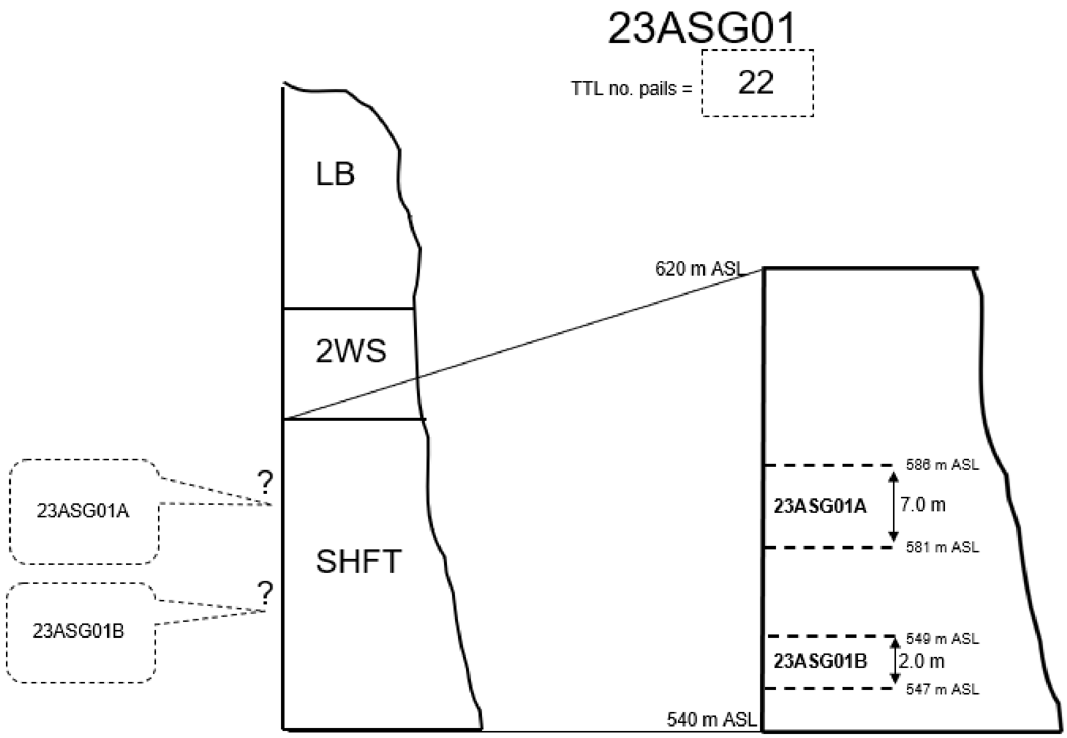
Figure 9.5 Bulk sample proportions for 23ASH01.



Outcrop	X_N83	Y_N83	X_N27	Y_N27
23ASH01B	443638.6	6387840	443693.6	6387616
23ASH01C	443629.6	6387844	443684.6	6387620
23ASH01A	443575.1	6387928	443630.1	6387703

Source: APEX (2025)

Figure 9.6 Bulk sample proportions for 23ASG01.



Outcrop	X_N83	Y_N83	X_N27	Y_N27
23ASG01A	446828.7	6385563	446883.6	6385338
23ASG01B	446781	6385422	446836	6385197

Source: APEX (2025)

A second phase of the bulk sampling program was completed in late October 2023. A small field crew finished sampling at one location and retrieved the bulk sample pails for transport to the APEX Edmonton office.

A total of 22 sample pails were collected from 23GOS01 (Labiche). The samples were composed of black shale from three separate channel locations, and comprised of approximately 20% channel material from 23GOS01A, 10% channeled material from 23GOS01B, and 70% channeled from 23GOS01C. There were 12 sample pails collected from 23ASH01 (Second White Specks). The samples are primarily composed of black shale and sandstone from three channel locations with approximately 70% from section 23ASH01A, 20% from 23ASH01B, and 10% from 23ASH01C. A total of 22 sample pails were collected from 23ASG01 (Shaftesbury) and were primarily composed of black shales and minor ash beds. Approximately 70% of the material is from 23ASG01A and approximately 30% from 23ASG01B. All samples are representative of the channel and were taken perpendicular to bedding.

Fifty-three bulk samples pails were shipped to Canmet ENERGY in Devon, Alberta on November 10, 2023 for bio heap leach metallurgical test work and matrix matching. Results are currently pending for the Canmet bioleaching work program.

10 Drilling

CMAI has yet to conduct any drilling at the SBH Property. Historical drill programs completed by companies other than CMAI are presented in Section 6 and summarized in the text that follows.

10.1 Historical Diamond Drilling

In total, 11 historical diamond drillholes for a total of 786.54 m (Table 10.1) have been completed within the SBH Property area The historical drilling was completed by Tintina Mines Ltd (1997) and DNI (2011 to 2012) and focused on the Lower Buckton, Buckton South, and Asphalt zones. All of the holes were drilled vertically and ranged in depth from 32.5 to 132.7 m. Drill collar locations are presented in Figure 10.1. Nine drillholes totalling 707.5 m were utilized in the conceptual exploration targets summarized in Section 10.2 (Table 10.2). Drillholes 11AS-03, 12BK01A and 12BK01B were excluded from the exploration target calculation as they did not penetrate past the overburden.

Table 10.1 Historical diamond drilling summary.

Company	Prospect/Deposit	Diamond Holes	Total Diamond (m)
Tintina Mines Ltd (1997)	Lower Buckton	1	132.65
Tintina Mines Ltd (1997)	Asphalt	2	166.10
DNI Metals Inc (2011)	Asphalt	3	190.02
DNI Metals Inc (2012)	Buckton South	5	297.77
	Total	11	786.54

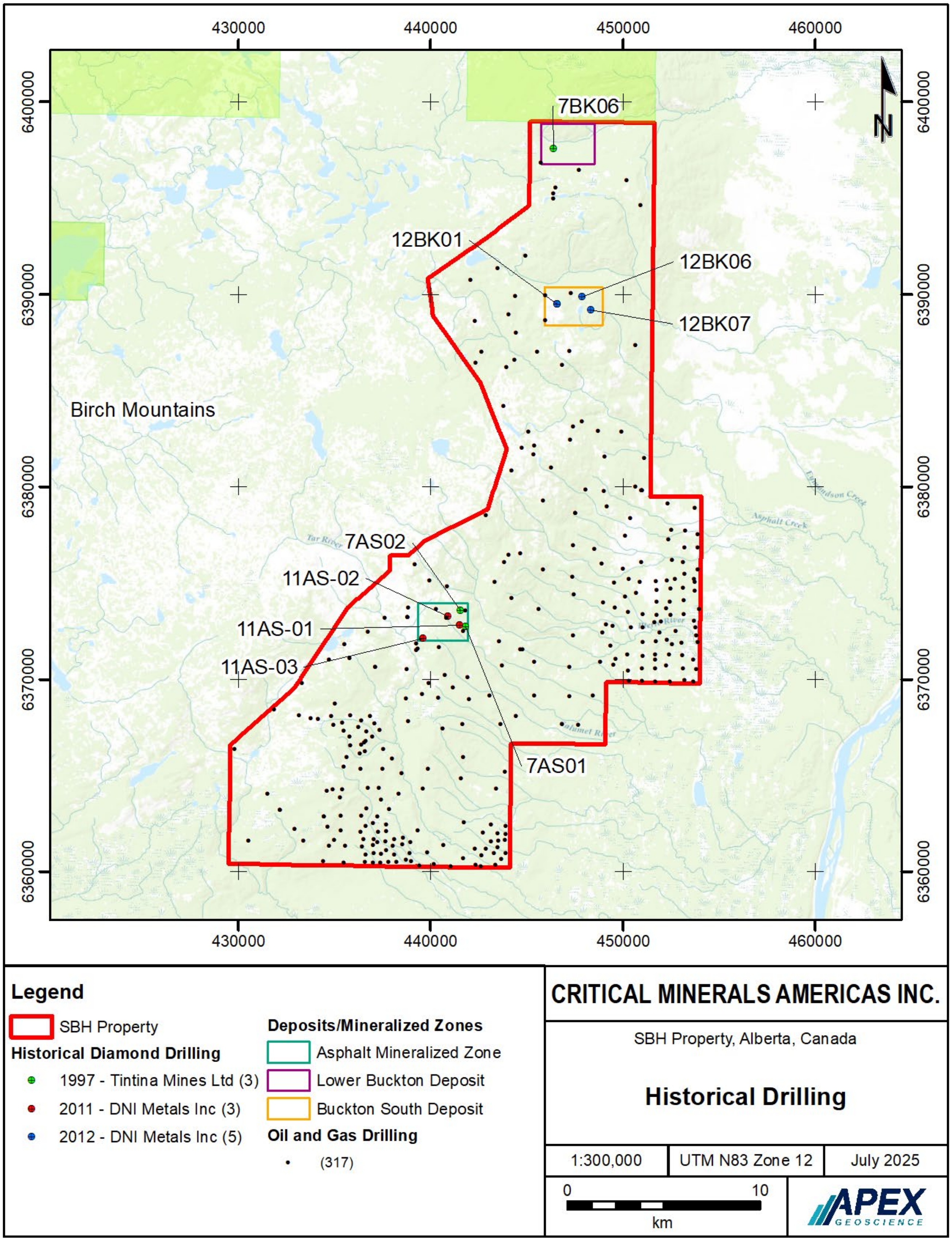
Source: APEX (2025)

Table 10.2 Drillholes utilized in the conceptual exploration target.

Hole ID	Year	Easting*	Northing*	Elevation (m)	Azimuth	Inclination	Depth (m)
7BK06	1997	446335	6397564	730	0	-90	132.7
7AS01	1997	441745	6372725	675	0	-90	76.3
7AS02	1997	441505	6373575	690	0	-90	89.8
11AS-01	2011	441465	6372821	688	0	-90	51.0
11AS-02	2011	440858	6373278	747	0	-90	106.5
12BK06	2012	447802	6389894	689	0	-90	76.3
12BK07	2012	448289	6389185	672	0	-90	63.5
12BK01	2012	446528	6389515	734	0	-90	111.5

Source: APEX (2025)
Notes*: Coordinates are in UTM NAD83 zone 12.

Figure 10.1 Historical drill collar locations.



Known sampling procedures, analyses, and quality assurance – quality control (QA-QC) procedures are summarized in the following text.

Detailed information on the sampling procedures, preparation, and security of the Tintina historical samples have not been preserved or subsequently located. However, the 1997 drill core was resampled by DNI in 2009 and again in 2012. DNI analytical blank control standards, and laboratory duplicates and standards were inserted into the 2012 reanalysis of the historical 1997 drill core sample stream at Actlabs to ensure quality and integrity of the laboratory results. Forty Labiche-1 analytical blank control standards were inserted into the 1997 reanalysis sample lot at a sample sequence of approximately one analytical blank control standard every 10 samples. In addition to the Labiche-1 analytical blank control standards, check assays were performed by Actlabs such that a pulp duplicate and a reject duplicate were inserted every 10 samples in the sample stream.

The Tintina re-sampled core samples were sent to Actlabs in Ancaster, Ontario, for preparation and analysis. In 2009, 14 composite samples were analysed by instrumental neutron activation analysis (INAA), ICP followed by aqua regia sample digestions, ICP following a total digestion in four acids, and analysis for carbon and sulphur (C-S) species by combustion (Leco) and Infrared (IR) analyses. In 2011, the same 14 composites were analysed using a full-suite REE package. In 2012, 391 samples of Labiche and Shaftesbury formations were analyzed by INAA and four acid total digestion ICP, REE assay and specific gravity (bulk density). The remaining Tintina drill core is currently stored at the AGS' Mineral Core Research Facility in Edmonton, Alberta.

The 2011-2012 DNI drill core, which was HQ in size, underwent a series of on-site procedures. Geotechnicians marked each meter of core and photographed it, after which the project geologist logged the core and selected sample intervals. Additional geotechnical processing included recording rock quality designation and core recovery and measuring the preliminary geochemistry of the core by using a portable X-ray fluorescence (XRF) analyzer. XRF samples corresponded to intervals that were sampled for standard lab assays.

For laboratory-based geochemical testing, one-metre samples were selected along the entire length of each core, independent of the geological units. Because formation boundaries generally did not correspond to even metre-marks, the sample immediately above each formation was generally truncated (<1 m). Subsequently, the top of each formation typically corresponds to the top of a one-metre sample. Analytical blank control standards "Labiche-1" and "Labiche-2were inserted into the sample stream in the field. A duplicate was taken of every 20th sample, but the duplicates were not inserted with the rest of the samples for lab analyses at Activation Laboratories Ltd. Rather, the duplicate samples were stored at APEX's warehouse for potential future analyses.

The samples were sent to Actlabs in Ancaster, Ontario, for preparation and analyses. The analyses of the 2011 and 2012 samples included measurement of bulk density, INAA, ICP analysis following a four-acid total sample digestion to incipient dryness and resolution in aqua regia, and analysis for carbon and sulphur (C-S) species by Leco and IR, and analysis for REE by ICP and ICP-MS following a fusion with lithium metaborate/tetraborate.

Additional detail regarding sampling procedures and analyses of historical drill core samples is provided in Section 11.

10.2 Conceptual Exploration Targets

Exploration targets were developed to provide a conceptual evaluation of the potential size and grade of mineralized shale horizons within the Property. Conceptual exploration targets were calculated for the Lower

Buckton, Buckton South and Asphalt zones for each of the laterally continuous Labiche, Second White Specks, and the Belle Fourche/Shaftesbury Formations. These exploration targets were prepared by APEX personnel under direct supervision of Mr. Dufresne, M.Sc., P.Geol., P.Geo. of APEX. Mr. Dufresne takes responsibility for the exploration targets detailed herein.

The exploration target tonnage, grade ranges, and contained metal estimates were calculated using the methodology described in Section 10.2.1. Results are presented separately for each target area and formation. Any deviations from the general methodology are noted in the relevant subsections below.

The SBH Property exploration targets' potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The exploration targets expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

10.2.1 Estimation Methodology

The exploration targets lateral extents were calculated centered around historical drilling at each Lower Buckton, Buckton South and Asphalt zones, and extended laterally until the perimeter equated between 625 and 750 masl (Figure 10.2) and restricted by the SBH Property boundary and the 100 m highway buffer running east-west in the centre of the Property. The 625 masl elevation contour approximately represents the basal erosional line of the Second White Specks Formation. The 750 masl contour defines an approximate maximum of 100 m of overburden and Labiche Formation. Local adjustments of a maximum of 20 m of elevation were made based on historical field observations, drilling, and historical mapping.

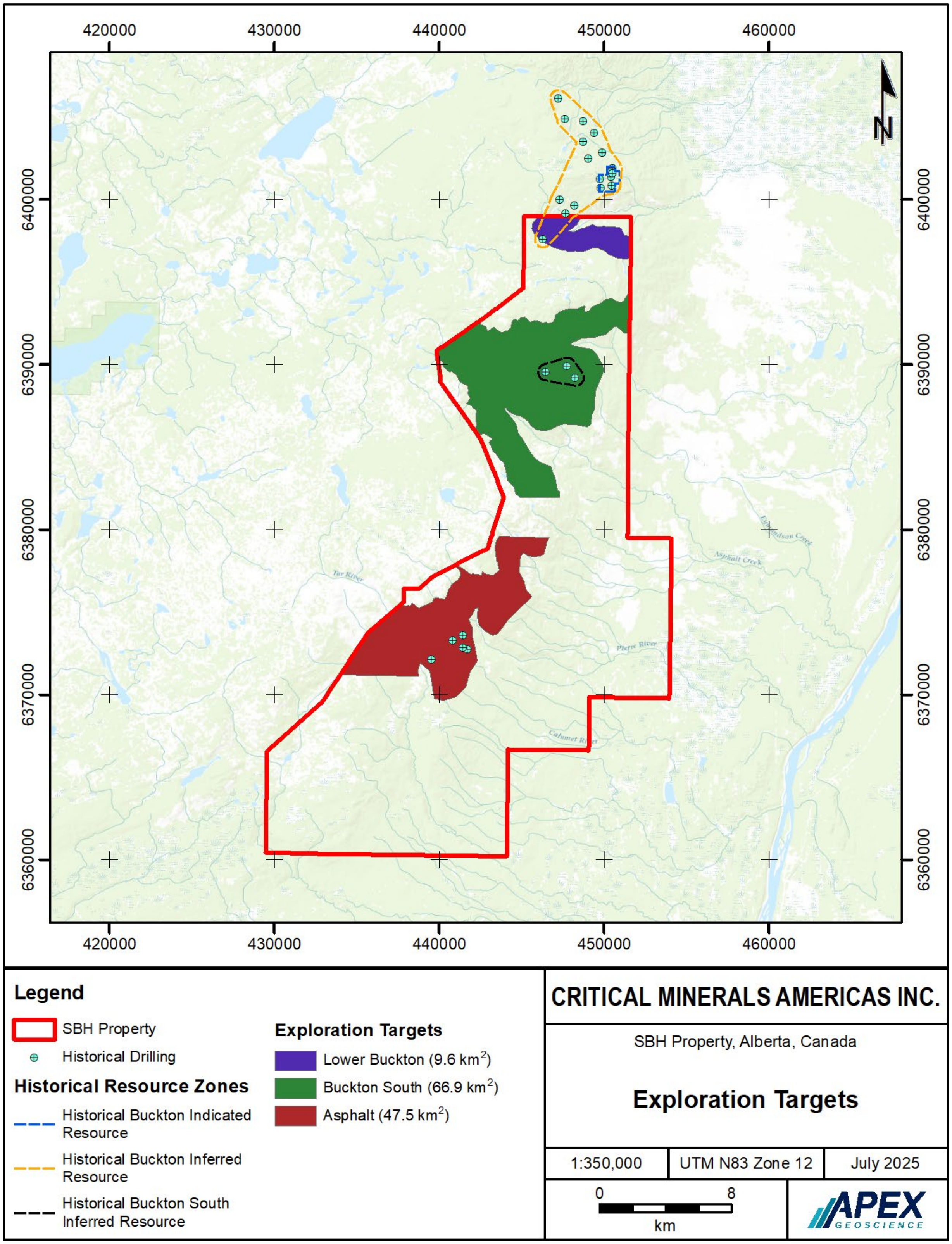
To calculate the ranges of raw tonnages, the average thickness of each formation within the target area was determined from the mean length of formation intercepts observed in historical diamond drillholes. For the Lower Buckton Formation, intercepts from drillhole 7BK03, located immediately north of the Property, were also included in the calculation due to the continuity of stratigraphy across the boundary.

The lateral extent of each formation was then multiplied by the calculated average thickness to derive a representative formation volume. To reflect inherent geological variability and uncertainty in thickness and continuity, a range of volumes was established by applying a ±20% adjustment to the calculated average volume.

These volume ranges were subsequently converted to tonnage by applying representative specific gravity (SG) values for each formation. Specific gravity values were derived from density samples collected within each formation, with only samples from within the defined exploration target areas considered in the analysis. Results from the Buckton South area returned higher-than-expected SG values for shale, particularly the Labiche Formation. To ensure a conservative approach, Buckton South and Asphalt density values were averaged for the Labiche and SWS formations, thereby reducing the impact of anomalously high shale values. For the Belle Fourche Formation, Asphalt density values were applied consistently across all target areas. The resulting tonnage ranges provide the basis for subsequent estimates of elemental content within the shales.

Elemental grades for the exploration targets were estimated from historical multi-element geochemical assays. For each formation at each exploration target, the length-weighted average grade of the sampled drillhole intercepts was calculated for the suite of rare earth elements and critical metals under consideration. To reflect uncertainty in the available data, a grade range was established by applying a ±20% adjustment to the calculated average for each element.

Figure 10.2 Exploration targets, historical drillholes and historical resource outlines for the SBH Property.



Contained metal ranges were derived by multiplying the minimum grade with the minimum tonnage and the maximum grade with the maximum tonnage for each formation at each target area. This approach provides a conceptual range of potential contained metal for each element within the shale units.

10.2.2 Lower Buckton

The Lower Buckton exploration target area is centered around drillholes 7BK06 and 7BK03. Drillhole 7BK03 is 203 m north of the property but due to the lateral and geological continuity of the Labiche, Second White Specks, and the Belle Fourche/Shaftesbury Formations, 7BK03 data is considered applicable to the Lower Buckton exploration target calculations. The resulting Lower Buckton target area and tonnages are restricted to that within the SBH Property boundary only.

The raw tonnage ranges were calculated from the average formation thicknesses of drillholes 7BK06 and 7BK03 multiplied by the lateral extent of the target area, with a ±20% adjustment applied to account for geological variability. Volumes were converted to tonnages using representative SG values for each formation. The resulting raw tonnage ranges for the Lower Buckton area are summarized in Table 10.3.

Table 10.3 Formation thickness and tonnage estimates for Lower Buckton exploration target at the SBH Property.

Lower Buckton				
Formation	Area (m^2)	Formation Thickness Estimated Range (m)	Density g/cm^3	Mass of Formation in Exploration Target Area Estimated Range, Mt
Labiche Formation	9,611,143	64.7 - 97.0	2.842	1,766 - 2,649
Second White Specks Formation	9,611,143	19.5 - 29.3	2.550	478 - 717
Belle Fourche/Shaftesbury Formation	9,611,143	3.3 - 4.9	2.660	83 - 125

Source: APEX (2025)

Note: The stated potential quantity and grade is conceptual in nature, and there has not been sufficient exploration to define a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The Exploration Target model has not been evaluated for reasonable prospects of eventual economic extraction. The Exploration Target model expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

The Lower Buckton exploration target contains approximately 2,327 – 3,491 Mt of total shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations. To calculate the estimated metal content of the Lower Buckton exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from 7BK06 and 7BK03. The resulting minimum and maximum grades for each element in the Lower Buckton target area are presented in Table 10.4.

In drillhole 7BK06, the Second White Specks Formation includes assays for only Zn, Ni, Co, U, Cu, Mo, and V. Assays for the remaining reported elements are absent; therefore, grade ranges for those elements in the Second White Specks Formation are derived from the other drillholes in the area.

Contained metal ranges were derived by multiplying the minimum grade with the minimum tonnage and the maximum grade with the maximum tonnage for each element per formation. The results for the Lower Buckton exploration target are presented in Table 10.5.

Table 10.4 Estimated grade ranges of the Lower Buckton exploration target in the Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations.

Lower Buckton Exploration Target Area			
Metal	Labiche Formation Grade Range (ppm)	Second White Specks Formation Grade Range (ppm)	Belle Fourche/Shaftesbury Formation Grade Range (ppm)
Mo	1.4 - 2.0	52.3 - 78.4	1.4 - 2.0
Ni	40.5 - 60.7	101.7 - 152.5	37.2 - 55.8
U	3.5 - 5.3	25.2 - 37.9	4.3 - 6.5
V	194.1 - 291.1	516.6 - 775.0	173.9 - 260.9
Zn	114.0 - 170.9	212.2 - 318.3	96.1 - 144.2
Cu	24.7 - 37.0	59.8 - 89.6	22.4 - 33.6
Co	11.3 - 17.0	16.7 - 25.1	9.6 - 14.4
La	30.7 - 46.0	50.4 - 75.6	34.6 - 51.9
Ce	55.3 - 83.0	78.3 - 117.4	63.6 - 95.4
Pr	6.6 - 9.9	10.9 - 16.3	7.5 - 11.2
Nd	25.8 - 38.7	44.6 - 66.9	26.6 - 39.9
Sm	5.0 - 7.5	9.2 - 13.7	5.0 - 7.6
Eu	1.0 - 1.5	2.0 - 2.9	1.1 - 1.6
Gd	4.2 - 6.3	8.6 - 13.0	4.2 - 6.3
Tb	0.6 - 1.0	1.3 - 2.0	0.6 - 1.0
Dy	3.6 - 5.4	7.3 - 11.0	3.8 - 5.8
Ho	0.7 - 1.1	1.5 - 2.2	0.8 - 1.2
Er	2.1 - 3.2	4.0 - 6.0	2.2 - 3.4
Tm	0.3 - 0.5	0.6 - 0.9	0.4 - 0.5
Yb	2.2 - 3.3	3.6 - 5.4	2.2 - 3.4
Lu	0.4 - 0.5	0.6 - 0.9	0.4 - 0.6
Y	21.4 - 32.2	47.1 - 70.7	21.3 - 31.9
Th	8.3 - 12.5	8.0 - 12.0	9.2 - 13.8
Sc	12.7 - 19.1	9.3 - 14.0	12.8 - 19.2
Li	58.8 - 88.2	46.5 - 69.7	57.0 - 85.5

Source: APEX (2025)

Notes:

1) The exploration target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The exploration target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.
2) Mass is reported in million metric tonnes (Mt), where 1 Mt equals 1,000,000 kilograms or approximately 2.2046×10^9 pounds. Tonnage figures are rounded to the nearest whole unit.
3) No cutoff grade is applied to the exploration target.

Table 10.5 Estimated metal content of the Lower Buckton exploration target in the Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations.

Lower Buckton Exploration Target Area			
Metal	Labiche Formation Total Metal (tonnes)	Second White Specks Formation Total Metal (tonnes)	Belle Fourche/Shaftesbury Formation Total Metal (tonnes)
Mo	2,400 - 5,400	25,000 - 56,200	110 - 250
Ni	71,500 - 160,800	48,600 - 109,400	3,100 - 7,000
U	6,200 - 13,900	12,100 - 27,100	400 - 800
V	342,800 - 771,300	246,900 - 555,600	14,500 - 32,600
Zn	201,300 - 452,900	101,400 - 228,200	8,000 - 18,000
Cu	43,600 - 98,100	28,600 - 64,300	1,900 - 4,200
Co	20,000 - 45,000	8,000 - 18,000	800 - 1,800
La	54,200 - 122,000	24,100 - 54,200	2,900 - 6,500
Ce	97,700 - 219,800	37,400 - 84,200	5,300 - 11,900
Pr	11,700 - 26,200	5,200 - 11,700	620 - 1,400
Nd	45,600 - 102,500	21,300 - 47,900	2,200 - 5,000
Sm	8,800 - 19,900	4,400 - 9,800	420 - 950
Eu	1,800 - 4,100	930 - 2,100	90 - 200
Gd	7,400 - 16,700	4,100 - 9,300	350 - 790
Tb	1,100 - 2,500	630 - 1,400	50 - 120
Dy	6,400 - 14,300	3,500 - 7,900	320 - 720
Ho	1,300 - 2,800	690 - 1,600	60 - 150
Er	3,800 - 8,500	1,900 - 4,300	190 - 420
Tm	570 - 1,300	280 - 620	30 - 70
Yb	3,900 - 8,700	1,700 - 3,900	190 - 420
Lu	640 - 1,400	270 - 610	30 - 70
Y	37,900 - 85,200	22,500 - 50,600	1,800 - 4,000
Th	14,700 - 33,000	3,800 - 8,600	760 - 1,700
Sc	22,500 - 50,600	4,500 - 10,000	1,100 - 2,400
Li	103,900 - 233,700	22,200 - 50,000	4,700 - 10,700

Source: APEX (2025)

Notes:

1) The Exploration Target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The exploration target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.
2) Mass is reported in million metric tonnes (Mt), where 1 Mt equals 1,000,000 kilograms or approximately 2.2046 × 10^9 pounds. Tonnage figures are rounded to the nearest whole unit.
3) No cutoff grade is applied to the exploration target.

10.2.3 Buckton South

The Buckton South exploration target area is centered around drillholes 12BK01, 12BK06, and 12BK07. The exploration target tonnages are restricted to the portion of this area that lies within the Property boundary.

Drillhole 12BK01 terminated in the Second White Specks Formation and did not penetrate the Belle Fourche/Shaftesbury Formation. As a result, thickness and grade estimates for the Belle Fourche/Shaftesbury Formation at Buckton South are derived solely from drillholes 12BK06 and 12BK07.

The raw tonnage ranges were calculated from the average formation thicknesses of drillholes 12BK01, 12BK06, and 12BK07 multiplied by the lateral extent of the target area, with a ±20% adjustment applied to account for geological variability. Volumes were converted to tonnages using representative SG values for each formation. The resulting raw tonnage ranges for the Buckton South area are summarized in Table 10.6.

Table 10.6 Formation thickness and tonnage estimates for Buckton South exploration target at the SBH Property.

Buckton South				
Formation	Area (m^2)	Formation Thickness Estimated Range (m)	Density g/cm^3	Mass of Formation in Exploration Target Area Estimated Range, Mt
Labiche Formation	66,921,689	29.9 - 44.8	2.842	5,682 - 8,522
Second White Specks Formation	66,921,689	11.5 - 17.2	2.550	1,956 - 2,934
Belle Fourche/Shaftesbury Formation	66,921,689	14.7 - 22.1	2.660	2,619 - 3,928

Source: APEX (2025)

Note: The stated potential quantity and grade is conceptual in nature, and there has not been sufficient exploration to define a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The Exploration Target model has not been evaluated for reasonable prospects of eventual economic extraction. The Exploration Target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

The Buckton South exploration target contains approximately 10,257 – 15,384 Mt of total shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations. To calculate the estimated metal content of the Buckton South exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 12BK01, 12BK06, and 12BK07. The resulting minimum and maximum grades for each element in the Buckton South target area are presented in Table 10.7.

Contained metal ranges were derived by multiplying the minimum grade with the minimum tonnage and the maximum grade with the maximum tonnage for each element per formation. The results for the Lower Buckton exploration target are presented in Table 10.8.

Table 10.7 Estimated grade ranges of the Buckton South exploration target in the Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations.

Buckton South Exploration Target Area			
Metal	Labiche Formation Grade Range (ppm)	Second White Specks Formation Grade Range (ppm)	Belle Fourche/Shaftesbury Formation Grade Range (ppm)
Mo	1.6 - 2.4	48.7 - 73.1	2.3 - 3.5
Ni	39.9 - 59.9	103.3 - 154.9	34.7 - 52.1
U	3.8 - 5.6	21.0 - 31.4	4.1 - 6.1
V	222.1 - 333.2	605.2 - 907.9	184.5 - 276.7
Zn	122.6 - 183.9	218.9 - 328.4	100.8 - 151.2
Cu	27.8 - 41.6	69.1 - 103.6	24.9 - 37.4
Co	10.6 - 15.9	16.8 - 25.2	9.6 - 14.3
La	30.3 - 45.4	39.6 - 59.5	31.2 - 46.8
Ce	54.4 - 81.5	63.5 - 95.3	57.5 - 86.3
Pr	6.8 - 10.3	9.1 - 13.7	7.0 - 10.5
Nd	25.6 - 38.3	35.7 - 53.6	26.0 - 39.0
Sm	5.0 - 7.5	7.4 - 11.0	4.9 - 7.3
Eu	1.1 - 1.6	1.6 - 2.4	1.1 - 1.6
Gd	4.2 - 6.3	7.3 - 11.0	3.9 - 5.8
Tb	0.7 - 1.0	1.1 - 1.7	0.6 - 1.0
Dy	3.9 - 5.8	6.3 - 9.4	3.7 - 5.5
Ho	0.8 - 1.2	1.2 - 1.8	0.7 - 1.1
Er	2.3 - 3.4	3.4 - 5.2	2.1 - 3.1
Tm	0.4 - 0.5	0.5 - 0.7	0.3 - 0.5
Yb	2.3 - 3.5	3.2 - 4.7	2.2 - 3.2
Lu	0.4 - 0.5	0.5 - 0.7	0.3 - 0.5
Y	22.6 - 33.9	39.9 - 59.9	21.0 - 31.4
Th	8.3 - 12.5	8.3 - 12.4	8.7 - 13.0
Sc	12.5 - 18.8	9.6 - 14.4	12.1 - 18.2
Li	56.4 - 84.5	55.2 - 82.8	76.0 - 114.1

Source: APEX (2025)

Notes:

1) The exploration target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The Exploration Target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.
2) Mass is reported in million metric tonnes (Mt), where 1 Mt equals 1,000,000 kilograms or approximately 2.2046×10^9 pounds. Tonnage figures are rounded to the nearest whole unit.
3) No cutoff grade is applied to the Exploration Target.

Table 10.8 Estimated metal content of the Buckton South exploration target in the Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations.

Buckton South Exploration Target Area			
Metal	Labiche Formation Total Metal (tonnes)	Second White Specks Formation Total Metal (tonnes)	Belle Fourche/Shaftesbury Formation Total Metal (tonnes)
Mo	9,200 - 20,700	95,300 - 214,500	6,100 - 13,700
Ni	226,900 - 510,500	202,000 - 454,400	91,000 - 204,700
U	21,300 - 47,900	41,000 - 92,200	10,700 - 24,000
V	1,262,000 - 2,839,400	1,183,800 - 2,663,500	483,100 - 1,087,000
Zn	696,800 - 1,567,700	428,200 - 963,500	264,000 - 594,000
Cu	157,700 - 354,800	135,100 - 303,900	65,300 - 146,900
Co	60,300 - 135,700	32,800 - 73,800	25,000 - 56,300
La	171,900 - 386,700	77,500 - 174,400	81,600 - 183,700
Ce	308,800 - 694,800	124,300 - 279,600	150,700 - 339,000
Pr	38,900 - 87,400	17,800 - 40,200	18,300 - 41,300
Nd	145,200 - 326,800	69,900 - 157,200	68,100 - 153,100
Sm	28,300 - 63,700	14,400 - 32,400	12,800 - 28,700
Eu	6,100 - 13,600	3,200 - 7,200	2,800 - 6,300
Gd	23,800 - 53,500	14,300 - 32,300	10,100 - 22,800
Tb	3,800 - 8,500	2,200 - 4,900	1,700 - 3,800
Dy	22,200 - 49,800	12,300 - 27,600	9,700 - 21,700
Ho	4,400 - 9,800	2,400 - 5,300	1,900 - 4,300
Er	13,000 - 29,100	6,700 - 15,100	5,500 - 12,300
Tm	2,000 - 4,500	1,000 - 2,200	830 - 1,900
Yb	13,200 - 29,800	6,200 - 13,900	5,700 - 12,700
Lu	2,000 - 4,600	950 - 2,100	890 - 2,000
Y	128,400 - 289,000	78,100 - 175,600	54,900 - 123,500
Th	47,400 - 106,500	16,200 - 36,300	22,700 - 51,200
Sc	71,200 - 160,200	18,700 - 42,100	31,800 - 71,500
Li	320,300 - 720,600	108,000 - 242,900	199,100 - 448,000

Source: APEX (2025)

Notes:

1) The exploration target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The Exploration Target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.
2) Mass is reported in million metric tonnes (Mt), where 1 Mt equals 1,000,000 kilograms or approximately 2.2046×10^9 pounds. Tonnage figures are rounded to the nearest whole unit.
3) No cutoff grade is applied to the Exploration Target.

10.2.4 Asphalt

The Asphalt exploration target area is centered around drillholes 11AS-01, 11AS-02, 7AS01, and 7AS02. The exploration target tonnages are restricted to the portion of this area that lies within the Property boundary.

Drillhole 11AS-02 terminated in the Second White Specks Formation and did not penetrate the Belle Fourche/Shaftesbury Formation. As a result, thickness and grade estimates for the Belle Fourche/Shaftesbury Formation at Asphalt are derived solely from drillholes 11AS-01, 7AS01, and 7AS02.

The Labiche Formation was not present in drillhole 7AS01 and presumably eroded prior to the overburden accumulation. As a result, thickness and grade estimates for the Labiche Formation at Asphalt are derived solely from drillholes 11AS-01, 7AS02, and 7AS02.

The raw tonnage ranges were calculated from the average formation thicknesses of drillholes 11AS-01, 11AS-02, 7AS01, and 7AS02 multiplied by the lateral extent of the target area, with a ±20% adjustment applied to account for geological variability. Volumes were converted to tonnages using representative SG values for each formation. The resulting raw tonnage ranges for the Asphalt area are summarized in Table 10.9.

Table 10.9 Formation thickness and tonnage estimates for the Asphalt exploration target at the SBH Property.

Asphalt				
Formation	**Area (m2)**	**Formation Thickness Estimated Range (m)**	**Density g/cm3**	**Mass of Formation in Exploration Target Area Estimated Range, Mt**
Labiche Formation	47,383,526	11.6 - 17.4	2.842	1,560 - 2,340
Second White Specks Formation	47,383,526	8.7 - 13.1	2.550	1,053 - 1,579
Belle Fourche/Shaftesbury Formation	47,383,526	34.0 - 51.0	2.660	4,285 - 6,428

Source: APEX (2025)

Note: The stated potential quantity and grade is conceptual in nature, and there has not been sufficient exploration to define a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The Exploration Target model has not been evaluated for reasonable prospects of eventual economic extraction. The Exploration Target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

The Asphalt exploration target contains approximately 6,898 – 10,347 Mt of total shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations. To calculate the estimated metal content of the Asphalt exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 11AS-01, 11AS-02, 7AS01, and 7AS02. The resulting minimum and maximum grades for each element in the Asphalt target area are presented in Table 10.10.

In drillhole 7AS02, the Second White Specks Formation includes assays for only Zn, Ni, Co, U, Cu, Mo, and V. Assays for the remaining reported elements are absent; therefore, grade ranges for those elements in the Second White Specks Formation are derived from the other drillholes in the area.

Contained metal ranges were derived by multiplying the minimum grade with the minimum tonnage and the maximum grade with the maximum tonnage for each element per formation. The results for the Lower Buckton exploration target are presented in Table 10.11.

Table 10.10 Estimated grade ranges of the Asphalt exploration target in the Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations.

Asphalt Exploration Target Area			
Metal	Labiche Formation Grade Range (ppm)	Second White Specks Formation Grade Range (ppm)	Belle Fourche/Shaftesbury Formation Grade Range (ppm)
Mo	5.2 - 7.8	61.2 - 91.7	1.7 - 2.5
Ni	47.1 - 70.6	118.1 - 177.1	40.0 - 60.0
U	5.5 - 8.2	28.5 - 42.8	4.9 - 7.4
V	281.1 - 421.6	553.0 - 829.5	203.9 - 305.8
Zn	138.0 - 207.0	238.8 - 358.2	96.9 - 145.3
Cu	39.7 - 59.6	69.7 - 104.5	25.3 - 38.0
Co	12.6 - 18.9	18.8 - 28.1	9.9 - 14.9
La	32.1 - 48.2	63.0 - 94.5	34.4 - 51.7
Ce	56.4 - 84.7	95.9 - 143.8	61.2 - 91.8
Pr	6.9 - 10.3	14.5 - 21.7	7.5 - 11.3
Nd	26.3 - 39.5	60.3 - 90.4	28.8 - 43.2
Sm	5.2 - 7.8	13.1 - 19.7	5.7 - 8.5
Eu	1.1 - 1.6	2.8 - 4.3	1.1 - 1.7
Gd	4.5 - 6.7	12.7 - 19.0	4.8 - 7.3
Tb	0.7 - 1.1	1.9 - 2.9	0.7 - 1.1
Dy	4.1 - 6.2	10.8 - 16.1	4.2 - 6.3
Ho	0.9 - 1.3	2.1 - 3.1	0.8 - 1.3
Er	2.5 - 3.7	5.6 - 8.5	2.5 - 3.7
Tm	0.4 - 0.6	0.8 - 1.2	0.4 - 0.6
Yb	2.5 - 3.8	5.0 - 7.4	2.5 - 3.7
Lu	0.4 - 0.6	0.8 - 1.2	0.4 - 0.6
Y	23.9 - 35.8	69.8 - 104.7	25.2 - 37.9
Th	8.4 - 12.6	9.1 - 13.6	9.4 - 14.1
Sc	12.6 - 18.8	10.3 - 15.4	12.4 - 18.6
Li	61.5 - 92.2	61.2 - 91.8	77.9 - 116.9

Source: APEX (2025)

Notes:

1) The exploration target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The Exploration Target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.
2) Mass is reported in million metric tonnes (Mt), where 1 Mt equals 1,000,000 kilograms or approximately 2.2046 × 10^9 pounds. Tonnage figures are rounded to the nearest whole unit.
3) No cutoff grade is applied to the Exploration Target.

Table 10.11 Estimated metal content of the Asphalt exploration target in the Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations.

Asphalt Exploration Target Area			
Metal	Labiche Formation Total Metal (tonnes)	Second White Specks Formation Total Metal (tonnes)	Belle Fourche/Shaftesbury Formation Total Metal (tonnes)
Mo	8,100 - 18,300	64,400 - 144,900	4,400 - 16,000
Ni	73,500 - 165,300	124,300 - 279,800	104,800 - 385,800
U	8,500 - 19,200	30,000 - 67,600	12,800 - 47,300
V	438,500 - 986,700	582,300 - 1,310,100	533,900 - 1,965,600
Zn	215,300 - 484,400	251,400 - 565,700	253,700 - 933,900
Cu	61,900 - 139,400	73,300 - 165,000	66,300 - 244,000
Co	19,700 - 44,200	19,700 - 44,400	26,000 - 95,900
La	50,100 - 112,800	66,300 - 149,200	90,200 - 332,000
Ce	88,100 - 198,100	100,900 - 227,100	160,300 - 590,200
Pr	10,700 - 24,100	15,200 - 34,300	19,800 - 72,700
Nd	41,100 - 92,400	63,500 - 142,800	75,400 - 277,700
Sm	8,100 - 18,100	13,800 - 31,200	14,900 - 54,800
Eu	1,700 - 3,800	3,000 - 6,700	3,000 - 11,100
Gd	7,000 - 15,600	13,300 - 30,000	12,700 - 46,700
Tb	1,100 - 2,500	2,000 - 4,600	1,900 - 7,200
Dy	6,400 - 14,400	11,300 - 25,500	11,100 - 40,800
Ho	1,300 - 3,000	2,200 - 4,900	2,200 - 8,100
Er	3,900 - 8,700	5,900 - 13,400	6,400 - 23,700
Tm	600 - 1,400	840 - 1,900	1,000 - 3,600
Yb	4,000 - 8,900	5,200 - 11,700	6,500 - 23,900
Lu	640 - 1,400	820 - 1,800	1,100 - 3,900
Y	37,200 - 83,700	73,500 - 165,400	66,100 - 243,300
Th	13,100 - 29,500	9,500 - 21,500	24,700 - 90,800
Sc	19,600 - 44,100	10,800 - 24,300	32,400 - 119,400
Li	95,900 - 215,800	64,400 - 145,000	204,000 - 751,300

Source: APEX (2025)

Notes:

1) The exploration target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The Exploration Target expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.
2) Mass is reported in million metric tonnes (Mt), where 1 Mt equals 1,000,000 kilograms or approximately 2.2046×10^9 pounds. Tonnage figures are rounded to the nearest whole unit.
3) No cutoff grade is applied to the Exploration Target.

The Labiche, Second White Specks, and the Shaftesbury formations occur throughout the western portion of the Property area as confirmed by diamond drilling, oil and gas well logs, mapping, and sampling work. Any areas beyond the Lower Buckton, Buckton South, and Asphalt areas to the west of the Second White Specks erosional line has the potential for mineralized shales. Based on average tonnages calculated in Section 10.2, the total expansion potential for the SBH Property is approximately 97.9 km^2 with a potential to host an additional 15 to 23 Bt (billion tonnes) of black shale in the Labiche, Second White Specks, and the Upper Belle Fourche/Shaftesbury Formation (Figures 10.2 and 10.3). This area does not include a 1-km buffer around the Birch Mountain Airstrip.

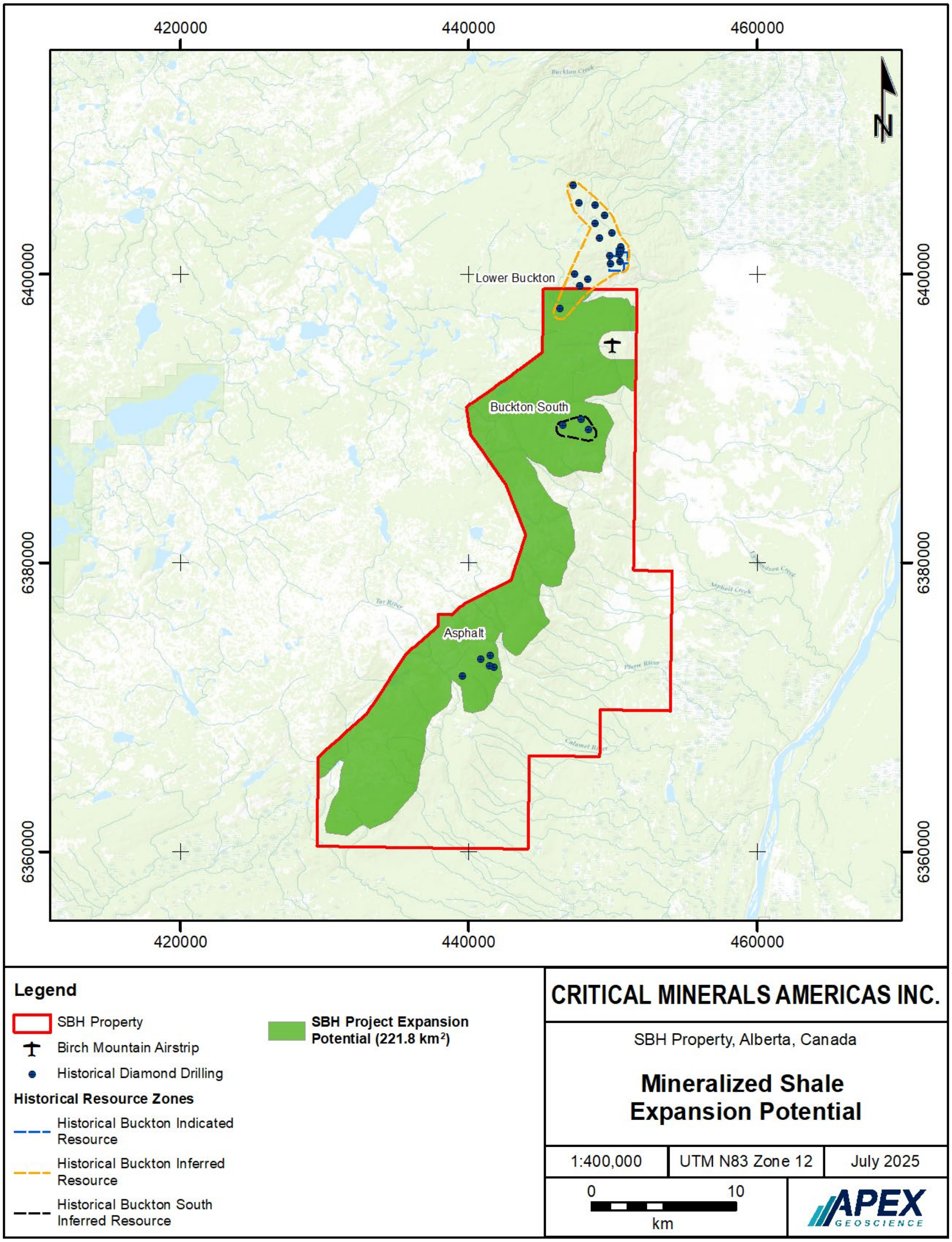
10.2.5 Risks and Uncertainties

The exploration targets presented in this Report are conceptual in nature and subject to a number of geological and data-related uncertainties. Key factors affecting the reliability of the tonnage and grade ranges include the following:

- The total tonnage of the Labiche Formation is subject to uncertainty due to variable glacial till cover and local variations in topography across the Property.
- Historical oil and gas well records suggest that the Belle Formation exceeds 100 m in thickness in several locations; however, diamond drilling completed on the Property has not penetrated more than 58 m into this unit. As the oil and gas well data have not been verified for accuracy or comparability with mineral exploration drilling, they were excluded from the thickness calculations used in the exploration target modelling.
- No assumptions regarding potential metal recoveries have been incorporated into the exploration target tonnage and grade ranges.
- The Labiche Formation density, particularly within the Buckton area, shows SG values that appear elevated relative to typical black shale density, thereby introducing uncertainty into the exploration target model. To mitigate this risk, conservative assumptions were applied by averaging Buckton South and Asphalt specific gravity values for the Labiche Formation, reducing the impact of the elevated readings. It is recommended that an exploratory data analysis of the SBH Property's density dataset be conducted prior to its application in a formal Mineral Resource Estimate.

The Reader is cautioned that the SBH Property exploration targets' potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The exploration targets expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

Figure 10.3 Mineralized shale exploration potential.



11 Sample Preparation, Analyses and Security

11.1 Sample Collection, Preparation and Security

11.1.1 DNI Historical Core Re-Sampling (2009-2012)

Considerable sample material from 1990’s Tintina exploration work, including the archival drill core splits from Tintina’s 1997 drilling program, is currently stored at the AGS’ Mineral Core Research Facility (MCRF) in Edmonton, Alberta. The samples collectively provide duplicate sample material for reference, verification and test work. The archived 1997 drill cores have twice been sampled at the MCRF by DNI, once in 2009 and again in 2012. This work was supervised and conducted by APEX and as such, chain of custody was maintained. In 2009, arrangements were made with the AGS to allow DNI to collect samples from the archived drill core; all available Second White Speckled Shale material was collected. Care was taken to ensure that the resampling intervals started or ended at historical sample boundaries (to enable comparisons between analyses of the 2009 samples with weighted averages of the historic samples).

In 2009, a total of 17 drill intervals were sampled of which 14 are intercepts of the Second White Speckled Shale within the Buckton Deposit. Additionally, several samples were collected in 2009 from the Shaftesbury Formation beneath the Second White Speckled Shale. A single intercept of Labiche Formation (from hole 7BK04), overlying the Second White Speckled Shale, was collected for the purpose of creating a matrix-matched analytical blank control standard for future work, the Labiche-1 analytical blank control standard.

In 2012, the historical (1997) Tintina cores archived at the MCRF were re-sampled a second time to collect samples intercepts of overburden, Labiche and Shaftesbury formations. A total of 391 samples were collected over the same drill sample intervals as the historical work. The re-sampling took place from June 3-7, 2012, and was completed by APEX staff under the supervision of Mr. Eccles, co-author of this Report. The sample distribution focused on geological units other than the Second White Speckled Shale and included 30 till, 252 Labiche and 109 Belle Fourche (Shaftesbury) samples. Sample lengths were based on the historical 1997 core intervals. In some instances, the shorter historical sample lengths were combined, particularly when the historical lengths were <0.5 m. The sample lengths of the 2012 re-sampling varied between 0.3 and 2.9 m with the most common sample length being 1.5 m (146 samples; 38%). The 391 samples were shipped to Activation Laboratories Ltd. (Actlabs) in Ancaster, Ontario in 12 pails on June 11, 2012 by APEX.

11.1.2 DNI Historical Drilling (2011-2012)

During its 2011 drill campaign, DNI completed eight HQ-diameter vertical diamond drillholes totaling 647.5 m. The following year, DNI's 2012 drilling program completed nine HQ-diameter drillholes, for a total of 982.1 m.

The 2011 drill core boxes were removed from the field by the drilling contractor (Lone Peak Drilling) for storage at a secure storage facility operated by APEX in Edmonton. Drill core logging and sampling was conducted by APEX staff under the supervision of Mr. Dufresne in Edmonton. A total of 674 samples were collected from the 2011 drill cores, including 531 from the Buckton Deposit. Sample intervals were generally 0.5 m in the Second White Speckled Shale Formation, and 1 m or more in all other formations. Five or six ‘shoulder’ samples, which were located above and below the Second White Speckled Shale contacts, were also sampled at 0.5 m intervals.

Cores from the 2012 drilling program were flown from the drill sites into camp by Highland Helicopters of Fort McMurray. Once in camp, one or more geotechnicians cleaned, metre-marked, photographed and processed the core, then each core was logged by the project geologist on site and sample intervals were picked. The geotechnical processing included recording rock quality designation and core recovery and measuring the preliminary geochemistry of the core by using a portable X-ray fluorescence (XRF) analyzer.

Sampling was done by cutting cores manually with a metal putty knife or similar instrument. Hard lithified zones were broken with a hammer and chisel. As the sampling was done in the field, the core was still relatively moist and soft, and therefore it was generally possible to sample the cores by manually cutting the cores. As the shale formations (and clay till) in the Buckton area dry-out, the core becomes more brittle and difficult to sample because the core tends to break and crumble. When core had dried out in the field to the point of being brittle, care was taken to avoid mixing of core pieces from individual sample intervals.

Samples were collected in clear polyethylene bags, which were labelled on both sides and contained a plastic sample tag; bags were sealed with regular zip tie-wraps. Analytical blank control standards "Labiche-1" and "Labiche-2were inserted into the sample stream in the field. A duplicate was taken of every 20th sample, but the duplicates were not inserted with the rest of the samples for lab analyses at Actlabs. Rather, the duplicate samples were stored at APEX's warehouse for potential future analyses.

11.1.3 CMAI Soil Sampling (2023)

The 2023 soil sampling program was conducted by APEX on behalf of CMAI. The soil sampling medium was the B Horizon, 4 to 50 cm below the surface. Sample points in large wetlands or bogs with thick peat cover (>0.5 – 1.0m) were not collected and are listed as No Sample (NS).

Soil samples pits were dug using a hand shovel and pick ax to the B horizon of the soil. The organic layer and rock fragments were removed and up to 500 g of soil material was placed in a paper bag. The bag was labelled with a unique sample number, and the sample site and hole were photographed with the sample bag visible to verify the sample ID. A description of the sample site, sample material, depth, and any other comments regarding contamination were recorded using Fulcrum App on a smart phone.

Soil samples were dried in field rooms overnight and then transported to the APEX Edmonton office where they were stored until they were shipped to Actlabs in Ancaster, Ontario for analysis. For quality assurance and quality control (QA-QC), a duplicate was taken every 20th sample for a total of 7 field duplicates, which was included in the total samples.

11.1.4 CMAI Bulk Sampling (2023)

Outcrops from the Labiche (Lea Park), Second White Specks, and Shaftesbury (Belle Fourche) formations with the least amount of weathering and obvious slumping were chosen for bulk sampling. A few other locations with small, slumped outcrops located near the mapped contact of Second White Specks were also sampled.

All bulk samples were collected from outcrop via channel sampling. For each sampling location, 2-3 outcrop exposures were selected for channel sampling. Samples were collected with shovels and geotuls and transported in sealed 5-gallon plastic pails. Channel samples from the same formation were blended in one pail and labelled by location name. All sample pails for each formation were sampled in the same way with approximately the same proportion of material from each channel sample.

During the second phase of the program sampling was completed on 23ASG01B, and sample pails were collected for transport. A helicopter and longline were used to retrieve bulk sample pails. They were slung with a net to a staging area then transported and stored at the APEX office with a pickup truck and U-Haul trailer. Pails were weighed and labelled at the office. 53 of the bulk sample pails were shipped to Canmet ENERGY in Devon, Alberta. One pail from each formation (23GOS01V, 23ASH01M, and 23ASG01V) was shipped to Actlabs in Ancaster, Ontario, for analysis.

11.2 Analytical Procedures

11.2.1 DNI Historical Core Re-Sampling (2009-2012)

In 2009, the re-sampled core samples were sent to Actlabs in Ancaster, Ontario, for preparation and analysis. A total of 14 composite samples were analysed by instrumental neutron activation analysis (INAA), ICP followed by aqua regia sample digestions, ICP following a total digestion in four acids, and analysis for carbon and sulphur (C-S) species by combustion (Leco) and Infrared (IR) analyses.

In 2011, the same 14 composite samples were re-analysed using a full suite REE assay package.

In 2012, 391 samples of Labiche and Shaftesbury formations were analyzed by INAA and four acid total digestion ICP, REE assay, and bulk density.

Actlabs is an ISO/IEC 17025:2017 accredited and ISO 9001:2015 certified laboratory and is independent of the Authors, APEX, and the Company.

11.2.2 DNI Historical Drilling (2011-2012)

XRF samples corresponded to intervals that were sampled for standard lab assays. Sampling for XRF analyzer was done by scraping material from the core (generally about 2 cm^3) and homogenizing the material by hand. It should be noted that neither the sampling procedure (for XRF samples) nor the XRF instrument itself are considered acceptable substitutes for proper lab procedures and assays, respectively. Rather, the field-based XRF is used as a tool for the rapid acquisition of a large suite of semi-quantitative geochemical data that is used by project geologists to help with logging and drilling decisions in the field. In addition to logging the core using the same intervals chosen for laboratory-based geochemical sampling, the XRF analyzer was also used to confirm geologic contacts while logging in the field.

For laboratory-based geochemical testing, one-metre samples were selected along the entire length of each core, independent of the geological units. Because formation boundaries generally did not correspond to even metre-marks, the sample immediately above each formation was generally truncated (<1 m). Subsequently, the top of each formation typically corresponds to the top of a one-metre sample. The only exceptions to these rules occurred where a sample would have been less than 30 cm (in which case, two samples shorter than one-metre (but longer than 30 cm) were selected, and in the case of the metre above the top of the Second White Speckled Shale Formation, which was also sampled at a full metre, regardless of whether the sample above it had to be truncated.

The drill core samples were sent to Actlabs in Ancaster, Ontario, for preparation and analyses. The analyses of the 2011 and 2012 samples included measurement of bulk density, INAA, ICP analysis following a four-acid total sample digestion to incipient dryness and resolution in aqua regia, and analysis for carbon and sulphur (C-S) species by Leco and IR, and analysis for REE by ICP and ICP-MS following a fusion with lithium metaborate/tetraborate.

ActLabs in Ancaster is ISO/IEC 17025:2017 accredited and ISO 9001:2015 certified and is independent of the Authors, APEX, and the Company.

11.2.3 CMAI Soil Sampling (2023)

The 2023 soil samples were prepared and analysed at Actlabs in Ancaster, Ontario. At Actlabs, samples were air dried, then screened to pass -60 mesh. The soil material was leached for 1 hour in an enzyme matrix containing glucose oxidaze solution at 30ºC. The extracted solution was analyzed using ICP-MS.

Actlabs in Ancaster is ISO/IEC 17025:2017 accredited and ISO 9001:2015 certified and is independent of the Authors, APEX, and the Company.

11.2.4 CMAI Bulk Sampling (2023)

Three bulk sample pails (i.e. one pail from each formation sample 23GOS01V (Labiche/Lea Park), sample 23ASH01M (Second White Specks), and sample 23ASG01V (Shaftesbury/Belle Fourche) were shipped to Actlabs in Ancaster, ON for enzyme leach multielement analysis and for producing standard reference materials (SRM) required to complete QA-QC programs for future exploration.

Three samples were sent to Actlabs where they were dried, crushed, and pulverized before being split into subsamples for the following multiple analysis testing. Samples (0.5 g) were analyzed by Aqua Regia inductively coupled plasma optical emission spectrometry (QOP AquaGeo). Additionally, samples underwent whole rock analysis and XRF Fusion where they were crushed to 2 mm, and a 250 g split was collected and pulverized to 95% passing 105 microns. A portion of the sample was mixed with a 9.75 g flux and fused at a high temperature to form a homogenous glass bead. The glass bead was analyzed using an XRF. In addition, the samples were analyzed for carbon and sulphur after combustion using an infrared (IR) detection, and carbon/sulphur concentrations are used for metallurgical balances. A portion of each sample was crushed and pulverised to a fine powder then undergo near total digestion using a 4-acid mixture. The sample was analyzed by INAA and irradiated in a nuclear reaction. Gamma rays were measured to determine trace elemental concentrations. The digested solution from the 4-acid digestion is analyzed by optical emission spectrometry (ICP-OES) or ICP-MS, depending on detection limits. The samples are tested with a combined INAA and ICP technique for a complete elemental coverage.

The bioheap analyses at Canmet have yet to be completed as of the Effective Date of this Report.

11.3 Quality Assurance – Quality Control

11.3.1 DNI Historical Drilling and Core Re-Sampling (2009-2012)

Data collected from reanalyses of the historical 1997 drill core, and the 2011 and 2012 drill programs have been checked for reliability. The QA-QC procedures and results of the 2009 and 2012 reanalyses of historical 1997 core, and the analytical data from the 2011 and 2012 drilling programs were reviewed independently by Mr. Eccles, P.Geol. The results of field blanks, and laboratory standards and duplicates checked as part of this Report are within acceptable limits and suitable of use in this Report, including in the calculation of the conceptual Exploration Target summarized in Section 10.2.

11.3.1.1 Core Re-Sampling

The historical 1997 drill program included a minimal number of blanks, duplicates and standards in the sample stream. Therefore, as part of DNI's overall QA-QC protocol, a verification re-sampling program was conducted on the archived 1997 drill core in 2009. All available Second White Speckled Shale core in holes 7BK01, 7BK03 and 7BK05 were collected as 14 composite samples representing 99 original samples from 1997. The re-sampling relied on the original drill logs and the depth markers (wooden blocks) in the core boxes to determine sample intercepts. Actlabs inserted a series of blank samples, internal pulp duplicates, and industry standards into the sample stream. No issues were detected in results from the Actlabs QA-QC samples.

Comparison of the results from the 2009 historical core reanalysis program and the original analyses obtained in 1997 are presented in Dufresne et al. (2011). The verification analyses compare acceptably well with historical results with a few exceptions: organic carbon is lower in the 2009 data than in the original 1997 data; Br is consistently higher in the 2009 analyses than as documented in 1997; and 2009 bulk density measurements are 6%-19% higher than as reported in the historical work (Sabag, 2010). Linear regression analysis shows a correlation of better than 95% for Ni, Zn, Cu, Mo, Co, U and V. Based on this verification study, the original 1997 core assays are considered to be of excellent quality (Dufresne et al., 2011).

DNI's work highlighted the potential for extracting REEs and specialty metals (e.g., Li, Sc, Th) as incidental co-products to leaching of base metals from the shale. Subsequently, the Shaftesbury, Second White Speckled Shale and Labiche re-sampled core material collected in 2009 were analyzed in 2011 for a complete suite of REE, Y, Sc and Th by Actlab's analytical package Code 8 – REE Assay Package, which uses Fusion ICP and ICP-MS. These data were also deemed to be of excellent quality (Dufresne et al., 2011).

DNI analytical blank control standards, and laboratory duplicates and standards were inserted into the 2012 reanalysis of the historical 1997 drill core sample stream at Actlabs to ensure quality and integrity of the laboratory results. Forty Labiche-1 analytical blank control standards were inserted into the 1997 reanalysis sample lot at a sample sequence of approximately one analytical blank control standard every 10 samples. In addition to the Labiche-1 analytical blank control standards, check assays were performed by Actlabs such that a pulp duplicate and a reject duplicate were inserted every 10 samples in the sample stream.

In the opinion of the Authors, there were no issues with respect to the sample preparation or analyses in the historical exploration programs completed at the Property by DNI from 2009 to 2012. No significant issues were identified during the review of historical QA-QC data, and the data are considered suitable for use in the further evaluation of the Property and for its intended use in this Report. A detailed review of DNI's QA-QC performance is available in Puritch et al. (2014) on www.sedarplus.ca. While the report was written on behalf of DNI, the sections covering sample preparation, analyses, and QA-QC were authored by Mr. Dufresne and Mr. Eccles, the Authors of this Report.

11.3.1.2 Drilling

DNI's internal Labiche-1 analytical blank control standard, and laboratory duplicates and standards were inserted into the sample stream at Actlabs to ensure quality and integrity of the analytical results. The Labiche-1 analytical blank control standard was inserted once every 10 samples within the Second White Speckled Shale sample stream and once every 50 samples in the sample stream for glacial overburden, Labiche and Belle Fourche. Check assays were performed by Actlabs for all 2011 drill core lithologies. A pulp duplicate and a reject duplicate were inserted every 10 samples in Actlabs' sample stream.

The Labiche-1 (59 samples) and Labiche-2 (five samples) analytical blank control standards were inserted into the sample stream by APEX personnel in the field at the same time the core was sampled. Laboratory standards were also inserted into the same stream at the laboratory by Actlabs. In addition to the Labiche analytical blank control standards, check assays were performed by Actlabs such that a pulp duplicate and a reject duplicate were inserted every 10 samples in Actlabs' sample stream.

In the opinion of the Authors, there were no issues with respect to the sample preparation or analyses in the historical exploration programs completed at the Property by DNI from 2009 to 2012. No significant issues were identified during the review of historical QA-QC data, and the data are considered suitable for use in the further evaluation of the Property and for its intended use in this Report. A detailed review of DNI's QA-QC performance is available in Puritch et al. (2014) on www.sedarplus.ca. While the report was written on behalf of DNI, the sections covering sample preparation, analyses, and QA-QC were authored by Mr. Dufresne and Mr. Eccles, the Authors of this Report.

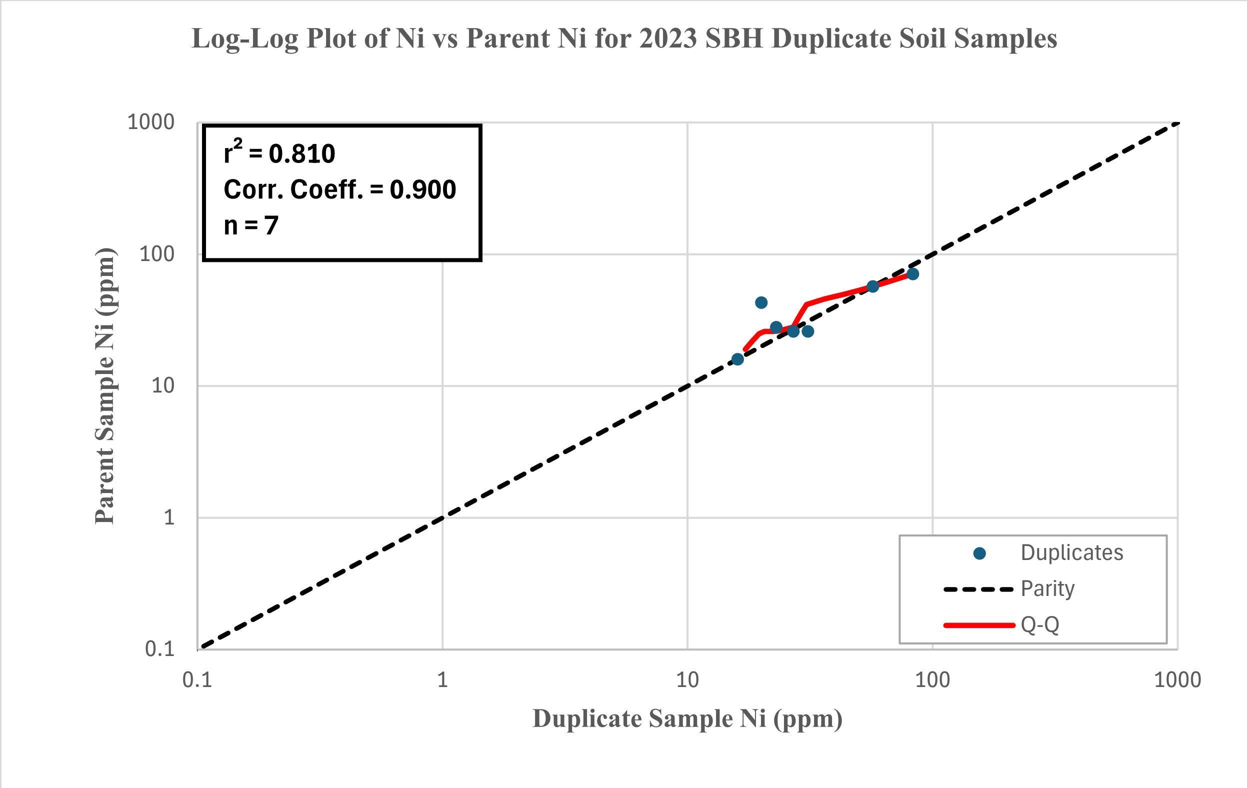
11.3.2 CMAI Soil Sampling (2023)

No standards or blanks were inserted into the 2023 SBH soil samples. Soil samples do not require the same degree of analytical precision and accuracy as other sample types (i.e., drilling samples), because soil geochemical data is not intended for use in any type of quantitative analyses (i.e., resource estimation). Instead, soil sample geochemical data is normally examined in terms of relative anomalies (i.e., percentiles) and absolute elemental concentrations are not as significant as they are for other types of samples.

The field crews conducting soil sampling work during the 2023 SBH fieldwork programs were instructed to collect consistent and representative (unbiased) samples from the same soil horizon (B horizon) whenever possible. Larger rock fragments and debris were removed from the sample, if present. The soil sampling dataloggers utilized by APEX samplers requires the recording of detailed sample and sample site descriptions which can be used to assess sample variance and bias.

The duplicate nickel analytical results for the 2023 SBH soil samples are illustrated in Figure 11.1. The duplicate nickel data shows there was no significant issue with sample variance and that there is overall good correlation between the original sample and duplicate sample results (correlation coefficient = 0.900). The average nickel values measured at 38.143 and 36.714 ppb for parent and duplicate samples respectively.

Figure 11.1 Log-Log Plot of 2023 SBH Soil Sample Duplicate Nickel Analytical Results



Source: APEX (2025)

To evaluate sample consistency, a total of 7 duplicates were collected in 2023 (Table 11.1). Duplicate samples correspond to 6.9% of the total soil samples taken at SBH. For QA-QC, a duplicate was taken every 20th sample by collection of additional soil from the same hole as the parent sample. This was done to test variability in sampling practice as well as in the mineralization being targeted.

Table 11.1 Summary of 2023 SBH Soil Sampling

Sample Type	Amount
Total Soil Samples	102
Duplicates	7
(Duplicate Sample Ratio, 1:x)	14.57

Source: APEX (2025)

Duplicate nickel analytical results were compared to their parent samples to ensure the repeatability of collected data. At SBH, the parent and duplicate analytical results display relatively good correlation, with r^2 value of 0.81 for Ni (ICP-MS) (Figure 11.1).

The SBH soil sampling program showed good correlation between parent samples and duplicates for nickel values.

11.3.3 CMAI Bulk Sampling (2023)

As of the Effective Date of this Report, the bulk samples collected on behalf of CMAI are awaiting test work at Canmet and no QA-QC data is available to report.

11.4 Adequacy of Sample Collection, Preparation, Security and Analytical Procedures

The Authors have reviewed the adequacy of the sample preparation, security, and analytical procedures of the historical and CMAI exploration programs and found no significant issues or inconsistencies that would cause one to question the validity of the data. The data within CMAI's database are considered suitable for use in the further evaluation of the Property and for its intended use in this Report.

12 Data Verification

12.1 Data Verification Procedures

The 1997, 2011 and 2012 drillholes were surveyed using a handheld Garmin GPS unit in UTM Zone 12 coordinates and NAD 1927 datum. The collar elevations have been subsequently modified for all drillholes by using 1 m resolution LiDAR. No down hole surveying was employed since all drillholes were vertical.

Drill core logging was completed in Microsoft Excel format, with hardcopy, PDF, and digital back-ups. The 1997, 2011 and 2012 drill core were logged and sampled by APEX personnel under the direct supervision of Mr. Dufresne and Mr. Eccles. All drill logs, collar data and analytical results from the 1997, 2011 and 2012 drilling programs were compiled in a master Excel drilling database by APEX.

At the time of compilation, all drillholes were manually checked and validated for collar, survey, lithological boundaries and assay data. Collar data was compared back to values on the original drill logs. Lithology codes were compared to original drill logs and assay results were compared to laboratory certificates (Eccles et al, 2012a; b).

In 2025, for the development of the exploration targets, APEX personnel reviewed the master assay data compilation to assess the various assay and re-assay generations and select the most appropriate assays for the grade calculations. The review addressed the 2009 and 2012 resampling programs' use different assay methodologies and different sample intervals versus the original 1997 program. Considerations for the review entailed: the most appropriate method for each element, for the most continuous sampling across the drillhole length, and the method the included the most elements of interest.

Assays from the 2009 and 2012 re-assay programs were selected over original 1997 samples except for those in the Second White Specks Formation in drillholes 7AS02 and 7BK06 as the original 1997 assays were the only ones available for those intercepts.

Once the assays were selected, APEX personnel reviewed the Excel drillhole database in Micromine (version 2024.0). Using Micromine's drillhole database validation function, the data was checked for overlapping sample and geological intervals, collar locations and orientations, and hole length discrepancies. No errors were detected. The drillhole database is deemed to be well organized, accurate and acceptable for exploration target calculations.

12.2 Qualified Person Site Inspection

Recent site visits by Mr. Michael Dufresne, M.Sc., P.Geol., P.Geo., President and a Principal of APEX and a Qualified Person, to the SBH Property were completed in November 2022, and in September 2023.

The November 17-18, 2022, site inspection included a helicopter flyover of the Property for general observations and to verify the location of historical drill collars. Mr. Dufresne verified the locations of 9 drill pads for 11 drillholes in Lower Buckton, Buckton South, and Asphalt Zones (Figure 12.1 and Table 12.1).

Figure 12.1 QP site visit locations and flight line.

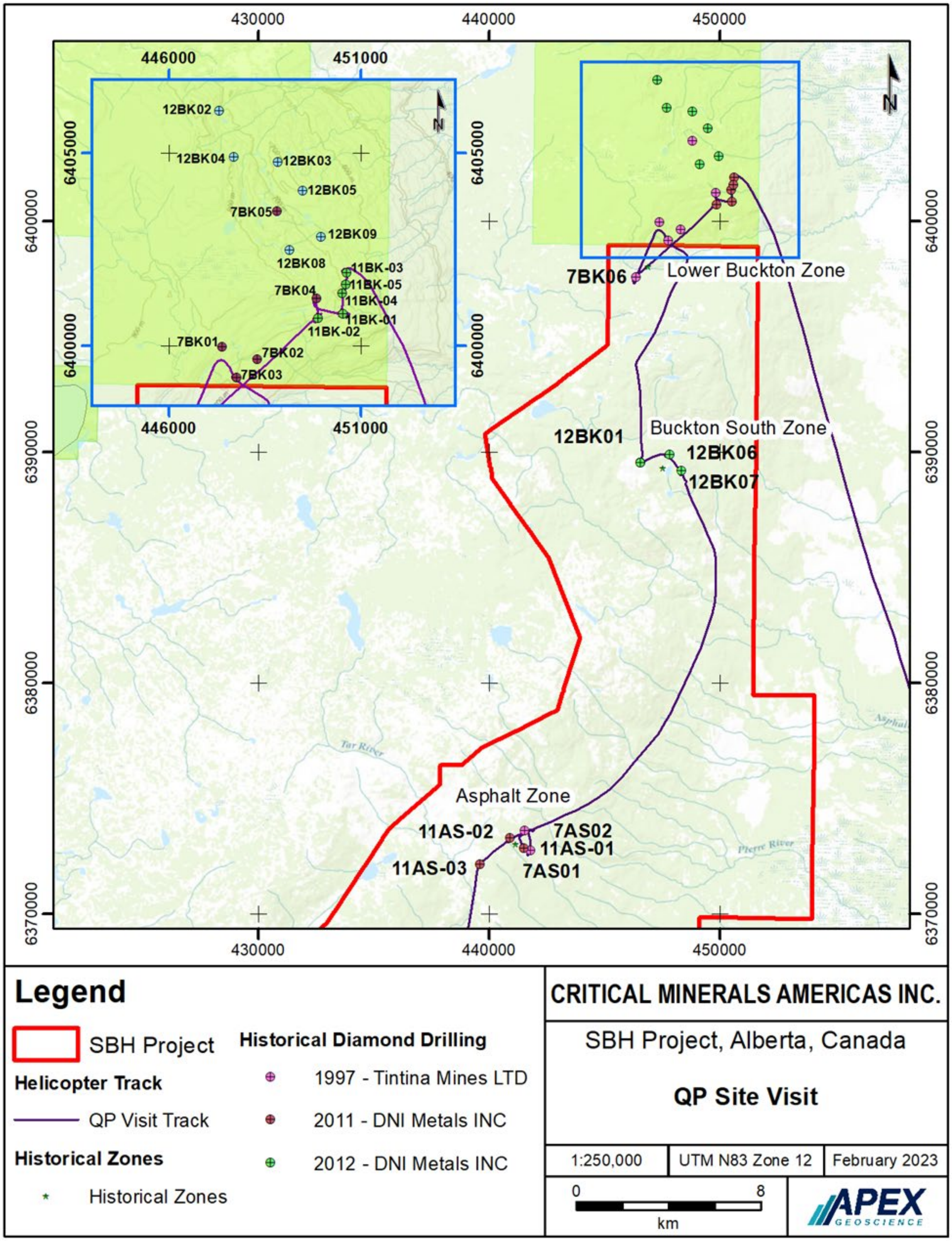


Table 12.1 QP drill collar verification.

Hole ID	Easting NAD83z12	Northing NAD83z12
7BK06	446390	6397340
7AS01	441800	6372500
7AS02	441560	6373350
11AS-01	441520	6372596
11AS-02	440913	6373053
11AS-03	439610	6371890
12BK01	446583	6389291
12BK01A	446583	6389291
12BK01B	446583	6389291
12BK06	447857	6389670
12BK07	448344	6388961

Source: APEX (2025)

Mr. Dufresne conducted a second site visit on September 21, 2023, during the CMAI outcrop sampling program and supervised APEX personnel conducting an outcrop trenching and sampling program. Exposures of the Second White Specks in Asphalt creek were observed and marked for sampling by APEX personnel.

The 2023 bulk sampling program was intended to collect large-volume rock samples from the Labiche (Lea Park), Second White Specks and Shaftesbury (Belle Fourche) formations for bioleaching and metallurgical test work, and to produce standard reference material (SRM) for future drill programs. Results are not yet available for the Canmet bioleaching work program, as of the Effective Date of this Report.

12.3 Validation Limitations

Surface sampling during the first Property visit was not possible due to the slumped condition of the surface exposures of the Speckled Shales, Shaftesbury, and Labiche Formations. Drill core is no longer stored on site and was not available to re-sample for this Report.

Results from the 2023 Canmet bioleaching work program that was observed by Mr. Dufresne are not available as of the Effective Date of this Report.

Assay data for the Shaftesbury shale is limited in the historical drilling as the drilling did not penetrate the entire thickness of the Shaftesbury Formation.

12.4 Adequacy of the Data

The Authors have reviewed the adequacy of all available historical and CMAI exploration data and conducted site inspections that verified the geological characteristics of the SBH Property. Upon review of historical data, SBH data, and the completion of the site inspections, the Authors have found no significant issues or inconsistencies pertaining to the validity of the analytical data or geological interpretations of the SBH Property. All data presented is deemed satisfactory for its intended use as verifiable background information for a geological introduction to the SBH Property.

13 Mineral Processing and Metallurgical Testing

CMAI has not conducted any mineral processing or metallurgical testing on samples from the SBH Property. A discussion of historical mineral processing and metallurgical testing on the Buckton deposit is provided in Section 6 of this Report and summarized below.

13.1 Bioleaching Test work on the Second White Speckled Shale

From 2009 to 2010, Dumont and DNI commissioned various bioleaching test work programs by the following laboratories:

1) Bureau de Recherches Géologiques et Minières (BRGM; BRGM, 2010);
2) Alberta Innovates Technology Futures (AITF and formerly the Alberta Research Council; Budwill, 2009, 2010a, 2010b, 2010c, 2012a, 2012b), Edmonton, Alberta; and,
3) Activation Laboratories Ltd., Ancaster, Ontario.

In general, the results from the bio leaching test work indicated that the metals that are of interest in the Second White Speckled Shale can be extracted by bio-leaching and/or acid leaching, and that most of the metals of interest are extracted with reasonable recoveries. The sulphuric acid leaching tests conducted by DNI at Activation Laboratories in 2009-2010 (DNI Metals Inc., 2010a; b) successfully demonstrated that:

- A collective group of metals can be extracted from the shale by simple leaching under conditions generally simulating bio-heap leaching;
- High recoveries can be achieved for Ni-U-Zn-Cd-Co, and middling recoveries for Cu-Li;
- Recoveries for Mo-V are poor, but can be enhanced by varying leaching parameters;
- Rare Earth Elements and rare metals contained in the shale, including Li, also report as co-products during leaching and that they represent previously unrecognized additional value to the shale; and
- The Second White Speckled Shale is likely amenable to bio-heap leaching, provided the shale contains bio-organisms suitable for bio-heap leaching and barring any toxicity presented to bio-cultures by the geochemistry of the shale.

Subsequent bioleaching test work completed by the ARC in 2009-2010, using bio-organisms cultured from the Second White Speckled Shale demonstrated that bio-organisms capable of growing under bioleaching conditions naturally exist in the Second White Speckled Shale and that enrichment cultures can be obtained from the Shale whose adaptation to the Shale is immediate, and that the shale's geochemistry is not toxic to the bio-organisms and does not inhibit start-up of bacterial growth. The test work overall demonstrated that the Second White Speckled Shale is amenable to bioleaching and to abiotic leaching in sulphuric acid, and that collective group of metals can be extracted (recovered) from it.

13.2 Leaching Test work on the Labiche Formation

Batch amenability tests (BATs) were carried out by Alberta Innovates Technology Futures (AITF, formerly the Alberta Research Council) on 200 g aliquots of Labiche Formation material (Sabag, 2012). The samples were bioleached during approximately a 65 period during which efforts were made to maintain a pH of 1.8, although pH varied from 1.4 to 1.8, and occasionally drifting to as low as 1.2. The samples were bioleached (in duplicate), and final residues (leaching tails) form one of the duplicates was further washed in HCl to assess metal losses through re-precipitation after they had been leached from the shale. The midpoint solution sample, the final solution and final tails (residues) were submitted to Actlabs in Ancaster, Ontario for analysis.

A summary of the best metal recoveries achieved during the bio-heap leaching tests from the Labiche shale, as reported by AITF, are as follows: Mo-57%, Ni-82%, U-78%, V-10%, Zn-76%, Cu-65%, Co-80%, Li-41% (Sabag, 2012). Recoveries for specialty metals and REEs, as calculated by DNI (based on the difference of metal content between head sample feed material and final tail residues per analytical results from AITF's test work), range as follows: La-13%-20%, Ce-21%-28%, Pr-28%-34%, Nd-35%-41%, Sm-49%-53%, Eu-55%-59%, Gd-61%-64%, Tb-60%-63%, Dy-61%-65%, Ho-58%-62%, Er-51%-55%, Tm-53%-57%, Yb-42%-47%, Lu-53%-57%, Y-56%-59%, Sc-28%-37%, Th-32%-34% (Sabag, 2012).

13.3 Metallurgical Testing – Canmet Mining

A series of metallurgical tests were completed with Canmet MINING to evaluate amenability of blended 1-2 kg samples of Second White Speckled Shale and Labiche to stirred-tank experiments and column testing (and ultimately heap leaching).

Constant pH stirred-tank experiments at 30ºC were conducted to assess bio-leaching and chemical-leaching with different lixivants, which were selected based on processing techniques for the ion-absorption type rare earth deposits in China. Initial leaching from the blended Asphalt sample is rapid, followed by a period of slow leaching. Greater than 80% of the mid-REEs were leached within two days with ammonium sulfate at pH 1.6. Iron and sulphur-oxidizing bacteria did not significantly increase metal leaching.

Five column leaching tests were completed, designed to assess the effect of different agglomeration techniques and compare bioleaching, dilute sulphuric acid leaching and ammonium sulfate leaching at pH 2. The tests showed that agglomerating the black shale with 5-10% sulphuric acid significantly increased the initial rate of metal extraction. A summary of the metal recoveries achieved during the stirred-tank experiments by Cameron et al. (2013) are listed in Table 13.1.

Table 13.1 Recovery percentages table of historical Canmet testing for blended Labiche and Second White Specks material.

Element	Recovery %	Element	Recovery %
Mo	3	Eu	61
Ni	64	Gd	63
U	70	Tb	65
V	7	Dy	65
Zn	52	Ho	64
Cu	25	Er	62
Co	72	Tm	60
Li	17	Yb	58
La	20	Lu	55
Ce	30	Y	67

Element	Recovery %	Element	Recovery %
Pr	40	Sc	24
Nd	43	Th	13
Sm	47		

Source: Cameron et al. (2013)

With respect to metals, the tests showed reasonable recoveries of Ni, U and Co, and low recoveries of V and Mo. Leaching efficiencies for Mo were generally <10% and a significant proportion of the total Mo is hosted in sulphide (30%) or ligand-associated phases (19%). The REE leaching efficiency increased with increasing atomic number, which is a positive sign for mid and heavy REE extraction. Further detail on the Canmet test work is provided in Section 6.3.

13.4 Potential Environmental Benefits

The bioleaching hydrometallurgy proposed for recovery of metals from the Alberta black shales on the Property entail processes whereby metals are dissolved from the material by iron/sulphur consuming naturally occurring bacteria, and effluents are subsequently treated with a variety of conventional chemical and electrochemical methods for sequential selective recovery (re precipitation) of each of the metals. Tailings material is transformed into a substantially inert waste during the process and leaching fluids are circulated or reused once they are stripped of their metal content.

As a very general overview, the envisaged bioleaching relies on naturally occurring bacteria which solubilize sulphidic metal minerals at ambient or moderate temperatures, which are species of the genus Thiobacillus (ferrooxidans) which are acid tolerant species. They are chemo-litho-auto-trophs whose only source of metabolic carbon is CO_2 and who derive their energy from the chemical digestion of inorganic matter, notably sulphides. All Thiobacilii metabolize sulphur and oxidize it to sulphates or sulphuric acid. As a process, bioleaching requires the addition of both sulphur and CO_2 to the leaching circuit, providing an excellent industrial scale "sink" for these elements.

Furthermore, the local availability of sulphur as a waste product of surrounding oil sands operations, is an added benefit to any leaching methods which might ultimately be formulated for the recovery of metals from the shales and could be a welcome sulphur waste mitigation activity in the region. Similar comments can also be made about local availability of considerable CO_2, H_2S, Limestone and other crushed stone all of which are supplies and reagents which the mining operations contemplated for production of metals from the Property will require.

A summary of historical test work completed to assess the potential of the Second White Specks Formation shale from the Property as a CO_2 “sink” to evaluate its capabilities for sequestering CO_2 is provided in Section 6.3.5.

14 Mineral Resource Estimates

No current mineral resource estimates have been complete for the SBH Property. A discussion of the historical mineral resource estimates of the Buckton and Buckton South Deposits is presented in Section 6.

*** Items 15 to 22 are not applicable to this Report ***

23 Adjacent Properties

The SBH Property is located immediately northwest of the mining operations of the Canadian Oils sands around Fort McMurray and Fort McKay. The Canadian Natural Resources Ltd (CNRL) Horizon oils sands operation is southeast of the SBH Property with a small overlap with the southeastern portion of the Property. Other adjacent properties to the SBH Property are the historical Buckton Zone deposit (DNI Metals Inc.), the Hammerstone Limestone Property and Quarry, the Athabasca Minerals Richardson rock aggregate Property, and the Highwood Management Keg River lithium brine Property, which is located within and immediately north of the Property, the Hammerstone limestone exploration Property is located immediately to the east of the Property boundary. Adjacent properties are presented in Figure 23.1.

The Reader is cautioned that the following section discusses mineralization that is not located on the SBH Property but is located in the vicinity of the Property. The Authors of this Report have not had the opportunity to visit all of these sites and mineral deposits or verify any of the information presented below, and the Reader is further cautioned that this information is not intended to imply that such mineralization exists at the SBH Property. The information provided in this section is simply intended to describe examples of the type and tenor of mineralization that exists in the region and that is being explored for on the SBH Property.

23.1 Athabasca Minerals Inc.

Athabasca Minerals Inc ("Athabasca") is an integrated group of small companies that develops and delivers sand and gravel products, technical services, and supply chain solutions. Athabasca currently holds the Richardson Property, located approximately 45 km northeast of the SBH Property. The Richardson Property is being assessed for its crush rock aggregate potential. An NI 43-101 technical report with a mineral resource estimate for the crush rock aggregate was published on behalf of Athabasca in 2019 (Eccles and Nicholls, 2019).

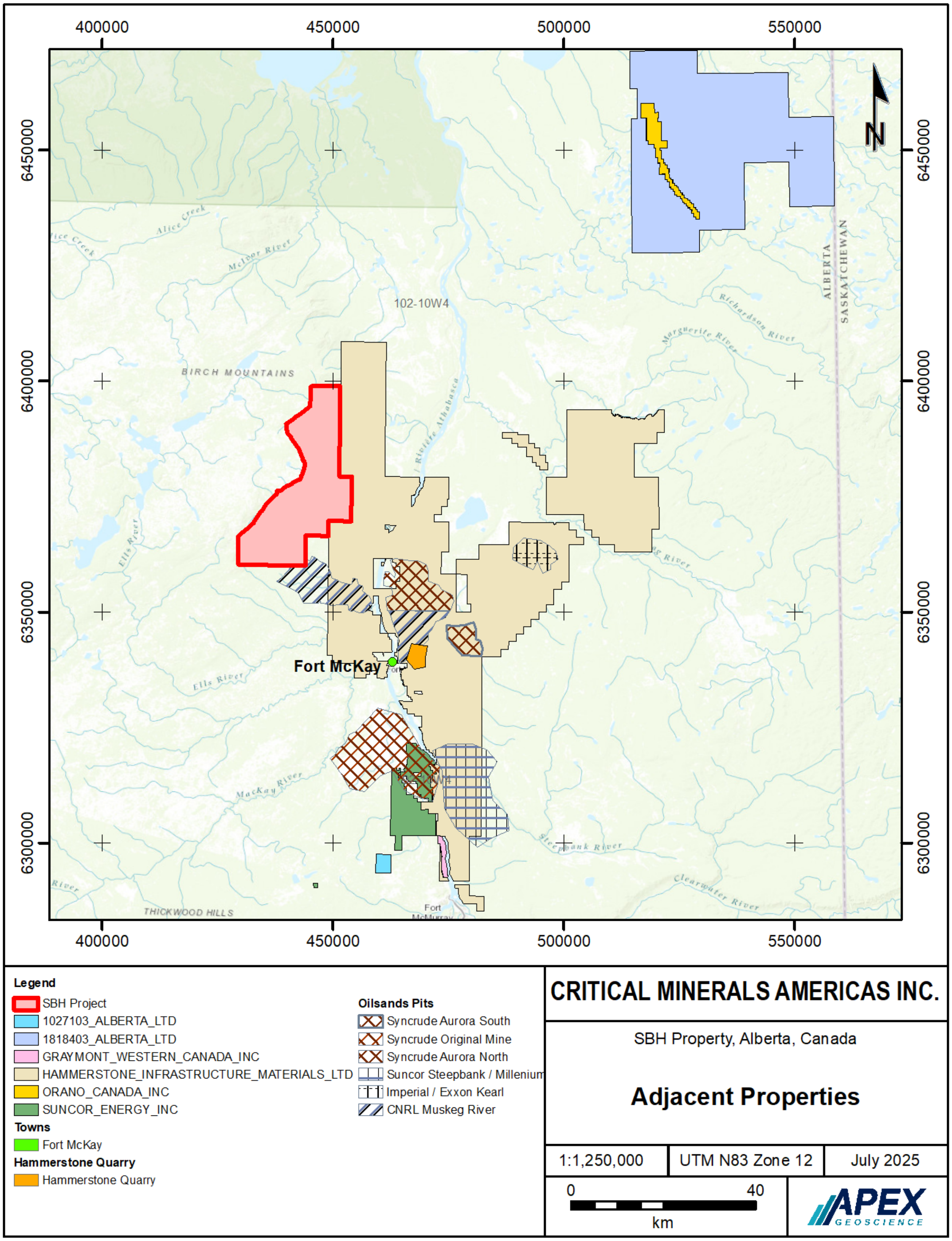
23.2 Highwood Asset Management

Highwood Asset Management is a Canadian-owned public asset management company overseeing activities in industrial metals and minerals, oil production, and oil midstream spaces. Highwood holds the Keg River Property located approximately 21 km east of the SBH Property. The Keg River Property is part of a large lithium-brine land package held by Highwood throughout Alberta and Northeast BC. A NI 43-101 technical report was published in 2021 for the Highwood Lithium Land Packages (Eccles et al., 2021).

23.3 Graymont Western Canada Inc.

Graymont Western Canada Inc and Lehigh Hanson Materials Limited holds the Parsons Creek aggregate Property located approximately 61 km southeast of the Property and approximately 6 km north of Fort McMurray. The Parsons Creek Property is a sand, gravel, and limestone aggregate production and supply center (Graymont, 2023; Parsons Creek, 2023).

Figure 23.1 Adjacent properties.



24 Other Relevant Data and Information

The Authors are not aware of any other information of a material nature relating to the SBH Property. There is no information relating to the Property, mineralization, metallurgical, environmental or social issues known to the Authors not mentioned in this Report.

25 Interpretation and Conclusions

25.1 Results and Interpretations

The SBH Property is a critical metal and mineral enriched black shale mineral exploration project located along the eastern slopes of the Birch Mountains in Northeastern Alberta, Canada. The SBH Property consists of nine (9) contiguous Alberta rock-hosted minerals permits comprising an aggregate of 46,666 ha (or 467 km^2).

25.1.1 Geology and Mineralization

The Property falls within the Northwestern portion of the Western Canada Sedimentary Basin near the erosional contact with the Precambrian crystalline basement rocks of the Canadian Shield. The Property is located immediately northwest of the Fort McMurray and Fort McKay Athabasca oil sands operations. The Property is located in the eastern portions of the Birch Mountains which are underlain by the Middle Cretaceous Colorado Group and Lower Cretaceous Mannville group sedimentary sequences. Mineralization in the SBH Property is hosted in metalliferous black shales in the Labiche (Lea Park), Second White Speck, and the Shaftesbury (Belle Fourche and Fish Scales) Formations.

The Labiche, Second White Specks and Shaftesbury Formations are stratigraphically uniform and extend laterally under much of the entire SBH Property, as proven by SBH Property-wide subsurface stratigraphic correlations using existing oil and gas wire-line logs, and historical 1997-2012 drilling results.

The three known mineralized zones on the Property are: the Lower Buckton Zone, the Buckton South Zone and the Asphalt Zone. Mineralization in these zones consists of stratabound enrichment of Mo-Ni-U-V-Zn-Cu-Co-Ag-Au plus REEs-Li-Sc-Th, hosted in a continuous 100-150 m thick "package" of flat-lying black shale formations. Mineralization is hosted in the Second White Specks Formation shale, the overlying Lea Park (Labiche) Formation shale, and the Fish Scales/Belle Fourche (Shaftesbury) Formation shale beneath it. The Second White Specks Formation shale has more attractive base metals grades, all three formations have significant REEs content, and elevated Li-Sc.

25.1.2 Historical Exploration

Polymetallic potential of the Upper Cretaceous shale units in the Birch Mountains was investigated by several companies since the 1990's. The Property and surrounding areas were actively explored by Tintina, Dumont and DNI between 1993-1998 and 2007-2014, respectively.

Tintina discovered the metal bearing black shales in 1995 while searching for metal bearing permeability traps in redox fronts across northeast Alberta. Tintina discovered several readily accessible, modest grade, near surface metal enriched zones in a stacked sequence of black shales but the metals discovered could not be collectively recovered by then available technologies. Tintina ceased its exploration activities in 1999 and allowed its permits to subsequently gradually lapse.

There was no further activity on the Property until its subsequent 2008 assembly by Dumont/DNI motivated by technological advances made in the mid 2000's in industrial scale application of bioleaching to economic collective bulk extraction of low grade metals from black shales offering novel opportunities for exploitation of metals-rich black shale deposits worldwide as a source of base metals, critical metals, REEs, Li and Sc.

DNI actively advanced prior discoveries through considerable work during the period 2007-2014 including soil and rock sampling, drilling, leaching test work (including bioleaching, acid leaching and column testing), several historical Mineral Resource Studies, and a historical PEA in 2014. The majority of the Buckton Zone falls outside of the current SBH Property boundaries, with approximately 87.1% of the 2013 historical Updated and Expanded Mineral Resource for the Buckton Zone located north of the current SBH Property boundary. The portion of the Buckton Zone that falls within the current SBH Property is known as the Lower Buckton Zone.

25.1.3 Recent Exploration

Exploration by CMAI at the SBH Property from 2022 to the Effective Date of this Report consisted of data compilation, LiDAR (light detection and ranging) imagery interpretation of portions of the Property, a B-zone soil sampling program, a bulk sampling program, and the calculation of conceptual exploration targets.

CMAI has identified three mineralized zones on the Property with drilling: the Lower Buckton Zone, the Buckton South Zone and the Asphalt Zone. These zones were delineated based on historical soil and rock sampling, along with some drilling, and have been retained by CMAI to facilitate referencing prior results and for the purpose of exploration and reporting. During the 2023 exploration program, CMAI conducted a soil sampling program over areas underlain by the Labiche, Second White Specks, and Shaftesbury formation shales. This program successfully expanded on the prior findings from historical programs. A bulk sampling program was also completed from surface outcrops of the Labiche and Shaftesbury formation shales for metallurgical test work and creation of standard reference materials. The results of the Canmet bioleaching work program that is in progress are not available as of the Effective Date of this Report.

25.1.4 Conceptual Exploration Targets

Exploration targets were developed to provide a conceptual evaluation of the potential size and grade of mineralized shale horizons within the Property. Conceptual exploration targets were calculated for the Lower Buckton, Buckton South and Asphalt zones for each of the laterally continuous Labiche, Second White Specks, and the Belle Fourche/Shaftesbury Formations. These exploration targets were prepared by APEX personnel under direct supervision of Mr. Dufresne, M.Sc., P.Geol., P.Geo. of APEX. Mr. Dufresne takes responsibility for the exploration targets detailed herein.

The exploration targets’ lateral extents were calculated centered around historical drilling at each Lower Buckton, Buckton South and Asphalt zones respectively, and extended laterally until the perimeter equated between 625 and 750 masl and restricted by the SBH Property boundary. The 625 masl elevation contour approximately represents the basal erosional line of the Second White Specks Formation. The 750 masl contour defines an approximate maximum of 100 m of overburden and Labiche Formation. Local adjustments of a maximum of 20 m of elevation were made based on historical field observations, drilling, and historical mapping.

To calculate the ranges of raw tonnages, the average thickness of each formation within the target area was determined from the mean length of formation intercepts observed in historical diamond drillholes. For the Lower Buckton Formation, intercepts from drillhole 7BK03, located immediately north of the Property, were also included in the calculation due to the continuity of stratigraphy across the boundary.

The lateral extent of each formation was then multiplied by the calculated average thickness to derive a representative formation volume. To reflect inherent geological variability and uncertainty in thickness and continuity, a range of volumes was established by applying a ±20% adjustment to the calculated average volume.

These volume ranges were subsequently converted to tonnage by applying representative SG values for each formation. The resulting tonnage ranges provide the basis for subsequent estimates of elemental content within the shales.

Elemental grades for the exploration target were estimated from historical multi-element geochemical assays. For each formation at each exploration target, the length-weighted average grade of the sampled drillhole intercepts was calculated for the suite of rare earth elements and critical metals under consideration. To reflect uncertainty in the available data, a grade range was established by applying a ±20% adjustment to the calculated average for each element.

Contained metal ranges were derived by multiplying the minimum grade with the minimum tonnage and the maximum grade with the maximum tonnage for each formation at each target area. This approach provides a conceptual range of potential contained metal for each element within the black shale units.

The Lower Buckton exploration target contains approximately 2,327 – 3,491 Mt of total black shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations. To calculate the estimated metal content of the Lower Buckton exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from 7BK06 and 7BK03.

The Buckton South exploration target contains approximately 10,257 – 15,384 Mt of total black shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations. To calculate the estimated metal content of the Buckton South exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 12BK01, 12BK06, and 12BK07.

The Asphalt exploration target contains approximately 6,898 – 10,347 Mt of total black shale material from the combined Labiche, Second White Specks, and Belle Fourche/Shaftesbury Formations. To calculate the estimated metal content of the Asphalt exploration target, grade ranges for the 25 elements were calculated using ±20% of the length-weighted average assays from drillholes 11AS-01, 11AS-02, 7AS01, and 7AS02.

Minimum and maximum grades for 25 elements are presented in Section 10 of this Report. The elements include Mo, Ni, U, V, Zn, Cu, Co, La, Th, Li, and all REEs except for Promethium. The SBH Property exploration targets' potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The exploration targets expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

25.1.5 Metallurgical Test Work

Several historical laboratory-scale metallurgical test programs have been undertaken on and around the SBH Property. Initially, metallurgical test work focused on recovering nine metals from the Second White Specks Formation. Subsequent studies expanded this scope to include the Labiche and Shaftesbury formations, as well as the recovery of REEs and Li. DNI's various leaching test work programs consisted of the following:

- Initial bottle roll cyanidation tests conducted at Actlabs by DNI on siliciclastic bone bed samples from 2009 field sampling.
- Sulphuric acid leaching tests conducted at Actlabs by DNI on select samples of Second White Specks Formation shale from litho-Section Asphalt-H, from 2009 field sampling.
- Bio-leaching test work conducted by the French Geological Survey (BRGM) on select samples of Second White Specks shale from Litho-Section Asphalt-H, from 2009 field sampling.

- Bio-organic culturing, adaptation and leaching test work conducted by the Alberta Research Council on select samples of Second White Specks shale from Litho-Section Asphalt-H, from 2009 field sampling.
- Bio-leaching amenability testing on surface trench sample BAT456 from late 2010 at the ARC.
- Bio-leaching amenability tests 2011-2012 at Alberta Innovates Technology Futures (AITF formerly the ARC) – on composite drill core samples BK1, BK2, BK3, BK4, BK5, and a blank, BKL.
- Canmet MINING's stirred tank and column bio-leaching test program in 2013.

In general, the metallurgical test work indicates that the metals that are of interest in the Second White Specks shale can be extracted by bio-leaching or acid leaching, and that most of the metals of interest are extracted with reasonable recoveries. The sulphuric acid leaching tests conducted by DNI at Actlabs in 2009-2010 successfully demonstrated that:

- A collective group of metals can be extracted from the shale by simple leaching under conditions generally simulating bio-heap leaching;
- High recoveries can be achieved for Ni-U-Zn-Cd-Co, and middling recoveries for Cu-Li;
- Recoveries for Mo-V are poor, but can be enhanced by varying the leaching parameters;
- REEs and rare metals contained in the shale, including Li, also report as co-products during leaching; and
- The Second White Specks shale is amenable to bio-heap leaching, provided the shale contains bio-organisms suitable for bio-heap leaching and barring any toxicity presented to bio-cultures by the geochemistry of the shale.

Subsequent bio-leaching test work completed by the ARC in 2009-2010, using bio-organisms cultured from the Second White Specks shale demonstrated that bio-organisms capable of growing under bio-leaching conditions naturally exist in the Second White Specks shale and that enrichment cultures can be obtained from the shale whose adaptation to the shale is immediate, and that the shale's geochemistry is not toxic to the bio-organisms and does not inhibit start-up of bacterial growth. The test work overall demonstrated that the Second White Specks shale is amenable to bio-leaching and to abiotic leaching in sulphuric acid, and that a collective group of metals can be extracted (recovered) from it.

The test work was expanded to include the Labiche and Shaftesbury shales. All three formations yielded similar positive result and indicate that the mineralization is not confined to just the Second White Speckled and Labiche formations, it also extends to the underlying Shaftesbury Shale, which had previously received limited attention and was omitted from the mineralized zones. Conclusions from the test work include:

- Test work results from different facilities concurred that all of the metals-REEs are held in the shale mostly in ionic forms which are easily liberated through acidification, rather than in sulphides requiring aggressive digestion, a conclusion corroborated by prior study of micro mineralogy.
- The results show that even a mild acidification relying on CO_2 will liberate the collective metals, offering opportunities to rely on CO_2 as a pre-treatment to additional acidification through sulfuric acid to follow.
- The test work from Canmet noted that abiotic leaching can achieve equivalent, albeit somewhat lower, recoveries, but that leaching duration is considerably faster than biotic processing. The foregoing recommended that future test work assess benefits of faster recoveries from abiotic processing, despite somewhat lower recoveries, in future economic assessments for potential mining operations.

A summary of the best metal recoveries achieved during the bio-leaching tests from the Labiche shale, as reported by AITF, are as follows: Mo-57%, Ni-82%, U-78%, V-10%, Zn-76%, Cu-65%, Co-80%, Li-41%. Recoveries for specialty metals and REEs, as calculated by DNI (based on the difference of metal content between head sample feed material and final tail residues per analytical results from AITF's test work), range as follows: La-13%-20%, Ce-21%-28%, Pr-28%-34%, Nd-35%-41%, Sm-49%-53%, Eu-55%-59%, Gd-61%-64%, Tb-60%-63%, Dy-61%-65%, Ho-58%-62%, Er-51%-55%, Tm-53%-57%, Yb-42%-47%, Lu-53%-57%, Y-56%-59%, Sc-28%-37%, Th-32%-34% (Sabag, 2012).

A summary of the blended Second White Speckled Formation and Labiche Formation metal recoveries achieved during the Canmet stirred-tank experiments are listed as follows: Mo-3%, Ni-64%, U-70%, V-7%, Zn-52%, Cu-25%, Co-72%, Li-17%, La-20%, Ce-30%, Pr-40%, Nd-43%, Sm-47%, Eu-61%, Gd-63%, Tb-65%, Dy-65%, Ho-64%, Er-62%, Tm-60%, Yb-58%, Lu-55%, Y-67%, Sc-24%, and Th-13% (Cameron et al., 2014).

The Canmet test work demonstrated that recoveries of the LREEs will be lower than those for HREEs from the blended Asphalt Zone shale samples will be difficult using conventional bioleaching. A significant proportion of the LREEs examined are associated with recalcitrant mineral phases that are not easily leached under oxidative conditions that would normally be expected to occur under heap bioleaching conditions (i.e. residual phases). It also noted that Cerium is expected to be the most recalcitrant with >30% of the element reporting to the most recalcitrant residual phase.

The sequential leaching tests also showed that nickel, uranium, and cobalt are the most amenable to heap bioleaching, due to a higher proportion of those metals being hosted by carbonate/exchangeable, ligand (labile carbon-associated) and sulphide phases. The tests also showed that vanadium and molybdenum will be the most difficult metals to recover, with ~90% of vanadium associated with the most recalcitrant phases that are not leached effectively at pH 2.

The stirred tank leaching tests showed that leaching of metals from the black shale occurs very rapidly, confirming what had previously been shown by all other leaching and bioleaching tests conducted at the BRGM, AITF and Actlabs. The Canmet column leaching test work was successful in demonstrating that it is technically feasible to leach REE and non-REE metals from the black shale samples tested (Second White Specks Formation shale) under conditions designed to replicate the environment within a heap bioleaching operation.

Canmet issued its final report in 2014, and no further work has been carried out since to expand on its findings, and those of the AITF, to advance collective metals recovery processing metrics toward testing of larger samples (bulk samples) with the natural view of advancing development of potential metals enriched Alberta black shales at the Property.

25.2 Conclusions

Based upon a review of available data and information, historical and CMAI exploration and metallurgical test work data, Mr. Dufresne's recent site inspections, and the conceptual exploration targets, the Authors outline the SBH Property is a "Property of Merit" that warrants future exploration and development work.

25.3 Risks and Uncertainties

The exploration targets presented in this Report are conceptual in nature and subject to a number of geological and data-related uncertainties. Key factors affecting the reliability of the tonnage and grade ranges of the exploration targets include the following:

- The total tonnage of the Labiche Formation is subject to uncertainty due to variable glacial till cover and local variations in topography across the Property.

- Historical oil and gas well records suggest that the Belle Formation exceeds 100 m in thickness in several locations; however, diamond drilling completed on the Property has not penetrated more than 58 m into this unit. As the oil and gas well data have not been verified for accuracy or comparability with mineral exploration drilling, they were excluded from the thickness calculations used in the exploration target modelling.

- No assumptions regarding potential metal recoveries have been incorporated into the exploration target tonnage and grade ranges.

- The Labiche Formation density, particularly within the Buckton area, shows SG values that appear elevated relative to typical black shale density, thereby introducing uncertainty into the exploration target model. To mitigate this risk, conservative assumptions were applied by averaging Buckton South and Asphalt specific gravity values for the Labiche Formation, reducing the impact of the elevated readings. It is recommended that an exploratory data analysis of the SBH Property's density dataset be conducted prior to its application in a formal Mineral Resource Estimate.

The Reader is cautioned that the SBH Property exploration targets' potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a mineral resource, and it is uncertain if further exploration will result in the estimation of a mineral resource. The exploration targets expressed should not be misrepresented or misconstrued as an estimate of a mineral resource or mineral reserve.

The Authors have considered risks and uncertainties that could reasonably be expected to affect exploration and development of the SBH Property. The Property is subject to the typical external risks that apply to all mineral exploration Properties, such as changes in metal prices, and volatility of supply and demand economics which can affect the availability of investment capital as well as changes in government regulations, community engagement and general environmental concerns. Other than what is listed below, the Authors are unaware of any unusual risk factors, other than risks normally associated with mineral exploration that might affect future exploration work and potential development of the Property.

26 Recommendations

Based on the results obtained from the current and previous exploration work conducted on the SBH Property, the following exploration work programs are recommended at the Buckton South, and Asphalt Zones. A two-phase work program is recommended, with Phase 2 exploration contingent on the positive results of Phase 1.

Phase 1

1) Carry out an HQ diameter diamond drilling program with the goal of defining an initial 2 billion tonnes of mineralized black shale material from the Buckton South and Asphalt target areas, respectively. An initial 4,000 m of drilling at 1,200 m drill collar spacing is planned in order to obtain drill core samples from the Labiche, Second White Specks and Shaftesbury Formations for analysis and metallurgical test work. Drilling will start where the historical drillholes were first located and then expand laterally. Drillhole lengths are planned at 120 m depth but will vary due to the thickness of the black shale units and overburden thicknesses.
2) A surface field program with soil and rock creek outcrop sampling and mapping should be conducted south of the Asphalt area to confirm the presence and grade of mineralized Labiche, Second White Specks, and Shaftesbury Formation material present. Several deep creeks in the southern portion of the Property have exposures of the Labiche, Second White Specks, and Shaftesbury formations.
3) Carry out follow up bioleaching metallurgical test work from fresh drill core samples to determine methods at increasing the overall recovery and the recovery rates of each metal and REE's contained in the Labiche, Second White Specks and Shaftesbury formations black shale units.
4) Construct at minimum a mineral resource estimate (MRE) for the Buckton South and Asphalt targets with an associated technical report that will eventually lead to a Preliminary Economic Assessment (PEA) of the Property.

The total estimated cost of Phase 1 is CAD$4,865,000 (Table 26.1).

Phase 2

Based on the positive results obtained from the Phase 1 work program, it is recommended that the following work programs be carried out:

1) Infill HQ diameter diamond drilling program at 600 m spacing be carried out with the goal of upgrading the Inferred mineral resources to the Indicated Mineral Resource category for both the Buckton South and Asphalt target areas. Several twin drillholes to be completed in order to collect sample material for metallurgical test work.
2) Carry out large-scale metallurgical test work program consisting of pilot-scale bioleaching (heap pads).
3) Carry out initial geotechnical and hydrological studies
4) Initiate environmental and wildlife studies

The Phase 2 drilling program plans to have a minimum two drillholes to intersect the complete thickness of the Shaftesbury Formation at Buckton South and Asphalt target areas in order to obtain samples for analysis. Previous drilling programs did not fully drill through the Shaftesbury Formation. As such, this initial phased drilling program will provide analytical data to determine the potential of hosting economic amounts of polymetallic mineralization, Li, Sc, and REEs and inclusion in a future updated resource estimate or PEA for both target areas.

The total estimated cost of Phase 2 is CAD$6,770,000 (Table 26.1).

Table 26.1 Proposed work program for the SBH Property.

Phase 1 Technical Program	
Activity	Estimated Cost (CAD)
Infill and Extension Drilling at Buckton South and Asphalt (4,000 m)	$4,000,000
Soil Sampling Program-South SBH	$200,000
Creek Mapping and Rock Sampling Program-South SBH	$50,000
Metallurgical Test Work	$125,000
Mineral Resource Estimation and Technical Report	$150,000
Phase 1 Subtotal	$4,525,000
Contingency (~7.5%)	$340,000
Phase 1 Total	$4,865,000

Phase 2 Technical Program	
Activity	Estimated Cost (CAD)
Infill drilling at Buckton South and Asphalt (5,000 m)	$5,000,000
Metallurgical Test Work, Leaching Test Work, and Bulk Sampling	$500,000
Geotechnical, Hydrological, Environmental Studies	$500,000
Preliminary Economic Assessment and Technical Report	$300,000
Phase 2 Subtotal	$6,300,000
Contingency (~7.5%)	$470,000
Phase 2 Total	$6,770,000

Source: APEX (2025)

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28 Certificate of Authors

28.1 Michael B. Dufresne Certificate of Author

I, Michael B. Dufresne, M.Sc., P.Geo., P.Geol., of Edmonton, Alberta, do hereby certify that:

1) I am a President and a Principal of APEX Geoscience Ltd. ("APEX"), with a business address of 100, 11450 – 160 St. NW, Edmonton, Alberta, Canada.
2) I am the Author and am responsible for Sections 1 to 3, 9 to 14, 23 to 27 of this Technical Report entitled: "NI 43-101 Technical Report on the SBH Property Birch Mountains, Athabasca Region, Alberta, Canada", with an Effective Date of July 1, 2025 (the "Technical Report").
3) I am a graduate of B.Sc. Degree in Geology from the University of North Carolina at Wilmington in 1983 and a M.Sc. Degree in Economic Geology from the University of Alberta in 1987. I have worked as a geologist for more than 40 years since my graduation from university and have been involved in all aspects of mineral exploration and mineral resource estimations for metallic and industrial mineral deposits in North America.
4) I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists ("APEGA") of Alberta since 1989 and a Professional Geoscientist with the Association of Professional Engineers and Geoscientists ("EGBC") of British Columbia since 2012. I am a 'Qualified Person' in relation to the subject matter of this Technical Report.
5) I have visited the Property that is the subject of this Technical Report on November 17-18, 2022, and September 21, 2023. I have conducted a review of the SBH Property data.
6) I am independent of Critical Minerals Americas Inc., as defined by Section 1.5 of National Instrument 43-101. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Company. I am not aware of any other information or circumstance that could interfere with my judgment regarding the preparation of the Technical Report.
7) I have had prior involvement with the Property that is the subject of the Technical Report, providing consulting expertise in the 1990's to Tintina Mines and during the period 2007 to 2014 to Dumont/DNI during construction of the historical MRE's and PEA, including Dufresne et al. (2011), Eccles et al. (2012a, b), Eccles et al. (2013a, b, c) and Puritch et al. (2014).
8) I have read and understand National Instrument 43-101 and Form 43-101 F1 and the Report has been prepared in compliance with the instrument.
9) To the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated and Signed this 29th day of August 2025 in Edmonton, Alberta, Canada

"Signed and Sealed"

Signature of Qualified Person
Michael B. Dufresne, M.Sc., P.Geo., P.Geol. (APEGA #48439; EGBC #37074)

28.2 D. Roy Eccles Certificate of Author

I, D. Roy Eccles, M.Sc., P.Geo., P.Geol., of Edmonton, Alberta, do hereby certify that:

1) I am a Senior Consulting Geologist and Chief Operations Officer of APEX Geoscience Ltd. ("APEX"), with a business address of 100, 11450 – 160 St. NW, Edmonton, Alberta, Canada.
2) I am the Author and am responsible for Sections 4 to 8 of this Technical Report entitled: "NI 43-101 Technical Report on the SBH Property Birch Mountains, Athabasca Region, Alberta, Canada", with an Effective Date of July 1, 2025 (the "Technical Report").
3) I graduated with a B.Sc. in Geology from the University of Manitoba in Winnipeg, Manitoba in 1986 and with a M.Sc. in Geology from the University of Alberta in Edmonton, Alberta in 2004.
4) I have worked as a geologist for more than 35 years since my graduation from university and have been involved in all aspects of mineral exploration, mineral research, and mineral resource estimations for metallic, industrial, specialty, and rare-earth element mineral properties and deposits.
5) I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) since 2003, and Newfoundland and Labrador Professional Engineers and Geoscientists (PEGNL) since 2015. I am a 'Qualified Person' in relation to the subject matter of this Technical Report.
6) I have previously visited the Property but have not conducted a recent site inspection of the Property that is the subject of this Technical Report. I have conducted a review of the SBH Property data.
7) I am independent of Critical Minerals Americas Inc., as defined by Section 1.5 of National Instrument 43-101. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Company. I am not aware of any other information or circumstance that could interfere with my judgment regarding the preparation of the Technical Report.
8) I have had prior involvement with the Property that is the subject of the Technical Report, providing consulting expertise in the 1990's to Tintina Mines and during the period 2007 to 2014 to Dumont/DNI during construction of the historical MRE's and PEA, including Dufresne et al. (2011), Eccles et al. (2012a, b), Eccles et al. (2013a, b, c) and Puritch et al. (2014) .
9) I have read and understand National Instrument 43-101 and Form 43-101 F1 and the Report has been prepared in compliance with the instrument.
10) To the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated and Signed this 29th day of August 2025 in Edmonton, Alberta, Canada

"Signed and Sealed"

Signature of Qualified Person
D. Roy Eccles, M.Sc., P.Geo., P.Geol. (APEGA #74150; PEGNL #08287)