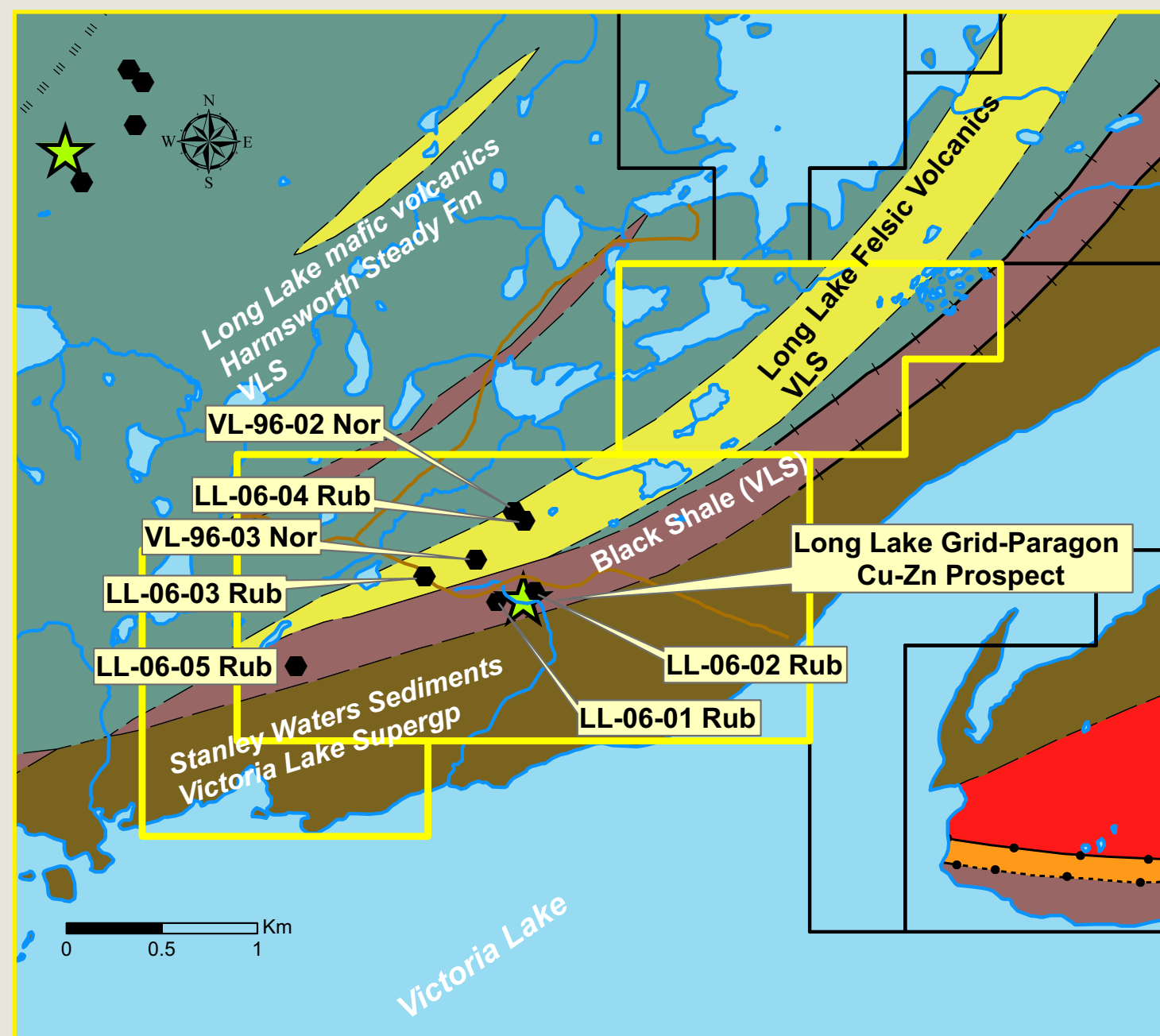


# NEWFOUNDLAND & LABRADOR

## Prospect · Discover · Develop



# Long Lake - Vanadium



Map 2: Claims Location and Regional Geology

Crisby-Whittle, L. V. J. (compiler) 2012: Bedrock geology dataset for the Island of Newfoundland. Newfoundland and Labrador Department of Natural Resources, Geological Survey, Open File NFDL/2616 version 7.0.  
Mineral Occurrence Source: Mineral Occurrence Database - Geological Survey, Department of Natural Resources Website: <http://www.gov.nl.ca/mines&en/geosurvey>

A comprehensive account of previous exploration in the region is available in Sparkes, for example (2006: Assessment Report for Joint Venture between Crosshair/Rubicon Minerals). Work completed by Rubicon consisted of compilation, prospecting, geological mapping and a 5 hole diamond drilling program in the Long Lake Grid (Figure 1) in the present Long Lake Property. Significant discoveries include a small float of massive pyrite-chalcocopyrite, which returned values of **3.62% Cu, 363 ppb Au, 6.5 ppm Ag and 490 ppm As** (RNF24517). Another large angular float containing semi-massive to massive bands of pyrite-sphalerite-galena in rhyolitic tuff(?) returned **0.88% Zn, 0.58% Pb, 46.8 ppm Ag and 37 ppb Au**. Drill hole LLW97-7 intersected **0.8 m of 0.24% Pb and 0.41% Zn and a 2.49% Zn**. The abundance of silica-sericite-pyrite altered rocks along parts of the shoreline of Long Lake also lends support to the potential for further base metal prospects or deposits in the belt. The Long Lake Belt hosts three massive sulphide occurrences discovered and drill tested by Noranda Inc. The most significant is the Long Lake "Deposit" (10 km on strike from the present property). The currently defined resource for the Long Lake main deposit is 407,000 tonnes of indicated reserves with grades of 7.82% Zn, 1.58% Pb, 0.97% Cu, 49 g/t Ag, and 0.57 g/t Au; and an additional 78,000 tonnes of similar grade inferred resources (Keller and Bernier, 2012).

### Highlights:

- New Vanadium discovery in historic drill core
- Core assayed up 0.478% V over 1.5 m
- Up to .349% V<sub>2</sub>O<sub>5</sub> over 29 m and .44% V<sub>2</sub>O<sub>5</sub> over 6 m
- New V zone hosted in black shale; open in all directions
- Black shale unit 250 m wide and at least 1.3 km long

**0.11% V over 1 m, including 0.26% V over 2 m and 0.2% to 0.29% over 6 m. Five other 1 m sections in this hole returned from 0.11% V to 0.18% V.**

In LL-06-2, shale and tuff units generally contain 3-10% pyrite and pyrite-pyrrhotite as disseminations and bands. Short sections reach up to 25% "bedded" pyrite. Local quartz-carbonate veins has trace amounts of remobilized chalcocopyrite and sphalerite. Similar to hole 06-01, 26 samples, mostly over 1 m, were taken in the top 67 m of core. **Fifteen of these samples returned > 0.13% V, including nine over 0.21% V and two at 0.33% and 0.36% V (latter two over 1 m and .77 m, respect).**

**Most of the sections are 1 m.**

In LL-06-03, the middle section of the hole containing black shales and tuffaceous rocks occurs below a major fault zone at 152.94 m. This fault zone can be correlated with the surface mapped/inferred thrust fault as indicated on recent GSC geology maps which indicate that Caradocian shales of the Ordovician Lawrence Harbour Formation are structurally overlain by middle-upper Cambrian felsic volcanics of the Costigan Lake Formation. Black graphitic shale occurs from 152.94 to 239.10 m contains approx 3-15% pyrite-pyrrhotite as disseminations and bands. **Twenty samples were taken from 152.94 to 192.6 m, most over 1.5 m sections. Seven of these had > 0.21% V, including two at 0.478% and 0.44% V.**

Several units of black shale were encountered in LL-06-5. From 191 to 210.5, 8 samples were taken and returned from **0.1% V up to 0.23% V - each sample over 1.5 m. Four samples were taken from 224 m and 230 m and returned between 800 ppm V up to 0.22% V.**

### Mineralization Model

Vanadium-rich black shales one of the 4 principal deposit types for V. Vanadium-rich metalliferous black shales occur primarily in late Proterozoic and Phanerozoic marine successions. The term shale is used here broadly to include a range of carbonaceous rocks that include mudstones, which have also been noted in core logs from Crosshair.

The **Long Lake Vanadium Property** (Map 1) is located approximately 125 km SSW of the town of Grand Falls-Windsor, and 65 km SW of the historic mining town of Buchans ( NTS sheet 12A/6). Access to the property is by taking the Buchans Highway (Route 372) to Buchans Junction. Logging road then lead SW to the property along Red Indian Lake to the Lloyds River area.

### Regional Geology

The property lies within the Exploits Subzone (Dunnage Zone) and is underlain by the Long Lake Group, part of the pre-Caradocian Victoria Lake Supergroup (VLS - Map 2) representing one of several pre-Caradocian island arc complexes in central Newfoundland. The Long Lake group hosts several significant VMS deposits including the Duck Pond and Boundary deposits. The property lies 6 km SE of the high-grade (zinc-rich massive sulphide) Boomerang Prospect. The group is dominated by felsic volcanic rocks, and lesser amounts of mafic volcanic rocks and intercalated volcano-sedimentary rocks and black shales. The rocks formed in volcano-sedimentary basins within active volcanic arcs on the peri-Gondwanan margin of the Iapetus Ocean.

### Local Geology

The Long Lake belt (Graves and Squires, 1992; Evans and Kean, 2002), comprise intercalated volcanic, volcanoclastic and sedimentary rocks that outcrop over a length of 70 km. The NW margin of the Long Lake belt is defined by a linear fault (interpreted from regional aeromagnetic maps) that marks the boundary between it and the Tulks Hill volcanics. The SE margin of the Long Lake belt is marked by a regionally extensive unit of carbonaceous black shale and argillite that separates it from the Tally Pond volcanics. Exposed on the eastern shore of Henry Waters is a sequence of altered and flattened porphyritic pillow lava referred to as the Henry Waters basalts (upper part of the Victoria Lake group? Evans and Kean, 2002). The SW portion of the property is underlain by a mix of volcanoclastics as well as strongly deformed shale and chert known as the "Caradocian Shale". Felsic to intermediate intrusive rocks have been noted by Noranda and may be similar to or related to the quartz monzonite suite at Valentine Lake immediately east of the property (Kean, 1977).

### Mineralization and Previous Work

Historically, exploration in the area has focused on the VMS potential of the Victoria Lake Supergroup.

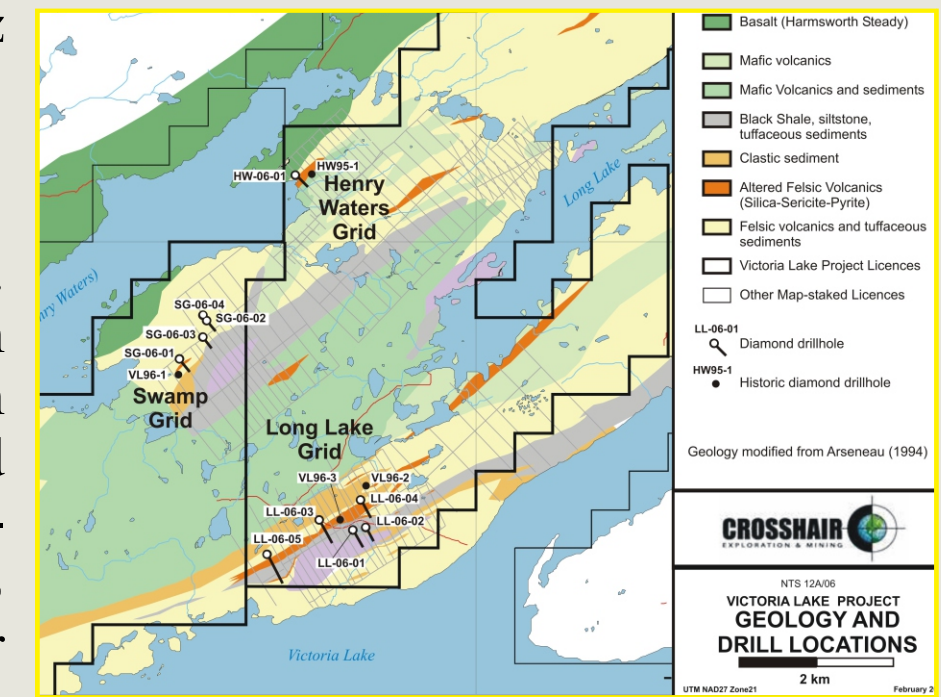


Figure 1: Drill Hole Locations: Sparkes, 2006

In recent years, the demand for Vanadium has sharply increased because of the large scale production of Vanadium Redox batteries. In 2006, there was little demand for V. Recent work by the present owner of the Long Lake Property led to the discovery of anomalous levels of V in black shale from drill core assays in a report by Sparkes (2006) for Crosshair/Rubicon Joint Venture.

In LL-06-01, black shale and tuff units generally contain 5-10% pyrite and pyrite-pyrrhotite as disseminations and bands. Short sections reach up to 30% pyritic sulphides. Local quartz-carbonate veins contain trace amounts of chalcocopyrite and sphalerite. Eighteen samples were taken over the first 60 m. With the exception of 2, 1 m sections, **all samples returned >**

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