

# OLD CROW SOLAR PROJECT

## A FIRST STEP TOWARDS ENERGY AND FINANCIAL SELF-SUFFICIENCY FOR THE VUNTUT GWITCHIN COMMUNITY

The community of Old Crow is a part of the Gwich'in Nation and receives electricity from diesel generators owned by Atco Electric Yukon. The Vuntut Gwitchin wants to live in symbiosis with nature and its environment. For several years now, the community has wanted to reduce its dependency on diesel. BBA helped the community optimize the solar PV project to be the most effective means of reducing use of diesel. The installation of 940 kW of solar panels and 612 kWh of battery storage will soon increase the community's energy self-sufficiency and reduce its greenhouse gas emissions.

The location of the community of Old Crow created a number of special requirements: a very remote site, accessible only by air; an arctic climate; low sun trajectory; and the need to respect local traditions.

BBA worked within the requirements and designed a viable and innovative solar project for the community. With its unique back-to-back panel design, foundations made from primarily local materials, minimal impact on the fragile permafrost, design for construction by locals, along with a respect for the traditions of the Vuntut Gwitchin, the project is well integrated into the surroundings, clean and 100% renewable.

### **BBA, partner in innovation in the Far North**

The highly innovative project is aimed at increasing the community's energy self-sufficiency and reducing its greenhouse gas emissions by installing 940 kW of solar panels and 612 kWh of battery storage. This will allow the utility to shut down the diesel generators for significant periods of the day in spring, summer and fall, and to partially replace diesel generation at other times. Because of its geographical location, the community enjoys 24 hour daylight during the summer months. However, the angle of incidence is much lower than usual for solar projects. In addition, it circles around the community, above the horizon, a full 360 degrees.

Along with management consultant Beyond Consulting, BBA acted as engineers of record and ensured that the special requirements were addressed creatively and innovatively. BBA's engineers conducted studies and then designed the 900 kW off-grid solar energy project including its integration with the diesel power plant; we also supervised construction at site.

BBA also used its expertise on regulatory issues to lead the First Nation through negotiations for a long-term electricity purchase agreement with ATCO. In addition, we provided support to the Yukon Government in finalizing its policy and the associated order in council.

## Project highlights

**Reduction of the community's diesel consumption** by 25%, or 190,000 litres per year

**Installation of 940 kW of solar panels and 612 kWh of battery storage** based on a unique design tailored to conditions in the Arctic Circle

**Back-to-back structure design** providing greater solidity against strong winds and making longer energy production possible by following the arc of the sun

**Optimized civil engineering design** relying on local knowledge to protect the fragile permafrost extending down to depths of 10 and 20m

**Great attention paid to protecting native berry plants** growing on site, regularly picked by community members

**Potential financing of future community development projects** with achieved fuel savings

**Participation by a number of community members** creating a feeling of great pride among the Vuntut Gwitching



**Nick Hawley, P.Eng (Yukon), PMP**

Nick Hawley is a department manager at BBA. He has been an engineer in power utilities and off grid projects for over 35 years working in various electricity utilities and IPPs. Mr. Hawley has experience in design and commissioning of generating equipment around the world.

Mr. Hawley has worked with First Nations communities for many years and managing renewable energy projects for both on and off grid communities including Community Energy Planning, business case preparation, construction and energy efficiency installations.

Mr. Hawley led the Old Crow solar PV project as design manager and mechanical engineer.



**Jean-Philippe Hamel, P. Eng (Yukon).**  
10+ years of experience

Mr. Hamel is an electrical engineer specialising in Protection and Control (P&C). He has over 11 years of experience in P&C design for utilities and industrial clients. Specifically medium and high voltage protection. He has been a member of the Association of professional engineers of Yukon since 2018 and within BC since 2010. Mr. Hamel has worked on multiple utility P&C projects at various voltage range from 13.8kV to 500kV.

Mr Hamel was the integrating (lead) electrical engineer for the Old Crow solar project.