

Synthetic ester oil transformer technology

We committed to using safe and modern technology at the West End Substation and, after a thorough review, we have decided to use synthetic ester oil insulated transformers within this substation.

Transformers are the heart of a substation. They ‘step down’ high voltage electricity to lower voltages that can be used in our homes and business.

Ester oil is known for its fire-resistant and biodegradable properties, which is why it is used in sensitive locations, and why we believe it’s the right technology for the West End Substation.

Why is oil used in transformers?

Almost all transformers contain oil, usually mineral oil, which has been in use since the late 1800s.

Transformer insulating fluids have two important functions, they:

1. Help cool transformers – which generate heat as they work, and
2. Insulate the transformer – so that the energized parts of the transformer remain isolated and do not malfunction.

Using oil in transformers helps ensure they work efficiently, reliably, and safely.

WHAT IS SYNTHETIC ESTER OIL?

Synthetic ester oil – also known as ester fluid – is an insulating fluid. It is a manufactured version of natural ester oil, which is commonly made from canola and soybean.

Ester oil is safely in use in transformers and other high-voltage equipment worldwide, including in:

- New York, U.S.A – at substations in environmentally sensitive areas bordering the Hudson River,
- London, UK – at a substation next to row housing and an elementary school, and
- Mexico City, Mexico – in more than 50 transformers serving the capital’s dense, urban population.

The use of ester oil use has increased in North America over the last decade with the development of synthetic ester oils, which perform particularly well in cold temperatures.

ARE SYNTHETIC ESTER OILS SAFE?

Synthetic ester oils have two main advantages:

- **Improved fire safety**
 - Synthetic ester oil is considered resistant to ignition and self-extinguishing.
 - It must reach very high temperatures to ignite and it cannot sustain the temperature needed to keep burning.
 - The selection of synthetic ester oil is just one element of our fire protection strategy for the West End Substation, and we are continuing to design other fire protection systems.
- **Improved environmental protection**
 - We take steps to prevent and contain leaks and spills within our substations, but if synthetic ester oil were to escape, it is readily biodegradable.
 - ‘Readily biodegradable’ substances break down quickly and easily when they are exposed to light, water, and microorganisms.
 - Within 28 days, almost 90% of synthetic ester oil should biodegrade.

WHY HAS BC HYDRO DECIDED TO USE SYNTHETIC ESTER OIL AT THE WEST END SUBSTATION?

When we reviewed available technologies, we decided that the safety and environmental properties of synthetic ester oil make it the right choice for this location.

BC Hydro safely operates and maintains over 300 substations across British Columbia. Each of these substations contains from one to four or more transformers, depending on the size of the community it serves.

We take a safety-by-design approach for each of our projects, considering the best equipment and methods for use at the specific project location and purpose.

The West End Substation is unique, because it will be built underground, and will operate in one of Vancouver's most densely populated neighbourhoods, close to a school, park and housing.

Contact us

If you have any questions or comments about this information, please reach out to the project team by email to westendsub@bchydro.com or phone to 604 341 1304.

