

Stormwater System and Wetlands

EIA Fact Sheet



Managing Aircraft Deicing Impacts

One of the most significant responsibilities for Edmonton International Airport (EIA) is the treatment of used glycol for aircraft deicing. The deicing fluids sprayed on aircraft are collected on deicing pads. During the spring thaw, when contaminated snow accumulates around the aprons melts, the remaining deicing fluid enters the EIA stormwater drainage system.



System Components

This glycol-contaminated run-off water is collected in two on-site ponds and is treated in our state of the art engineered wetlands treatment facility. The treated water is discharged to the nearby Whitemud Creek, under a licence from Alberta Environment. Figure 1 shows the overall location of the facilities on EIA property, and Figure 2 shows the major components of the system.

Deicing Activities

Growth at EIA has increased deicing fluid use – from just over 500,000 liters of deicing fluid in 2006 to just over 3,000,000 liters in 2014. This increase in use drove the need for EIA to develop more spring runoff containment capacity and a greater treatment capacity for the collected runoff.



Figure 1: Overall site layout

Wetlands Treatment System

Since 2000, EIA has successfully used a wetland system to treat glycol-contaminated stormwater; however, with a growth in aircraft operations, its treatment capacity was challenged. In 2011, EIA upgraded the system to engineered wetland facilities to add treatment capacity and to provide an opportunity for expandability in the future. The newly engineered wetlands added combined features that provide a significant increase in treatment capacity, with a much smaller environmental footprint

than the original system. Some of those features, as shown in Figure 3, include:

- Reusing existing infrastructure, including both the treatment cells and influent lift station
- Hydraulic upgrades that positively affect treatment capacity and discharge quality
- Enhanced system controls that allow for fine adjustments, ensuring treatment targets are met
- A robust aeration system that was installed in the primary and secondary cells that includes two 56 kW blowers and a total of 13,000 linear metres of aeration tubing

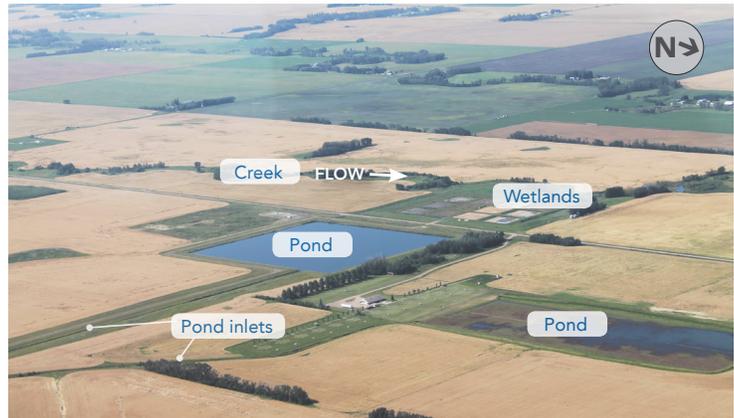


Figure 2: Storage ponds and original constructed wetland system

EIA's engineered wetland for treatment of glycol-contaminated stormwater is the first of its kind in Canada, and has also been implemented successfully in the U.S. and the U.K. The innovative design features – including the flow control and distribution, aeration system, nutrient addition process, and the recirculation system – as well as the repurposing of the existing facility, and the flexibility for expansion in the future, are the keys to the wetland's success.

Spring Odour Challenge

Once snow starts to melt in the spring, we segregate the more contaminated stormwater from the airfield in the Gun Club Pond, which feeds the wetlands for treatment. Since the wetlands operating systems cannot be switched on until we reach warmer night time temperatures in mid-May, the pond sits and

various chemical reactions start to occur naturally. Some of those reactions create odours that are not harmful, but can be unpleasant. Strong winds can also exacerbate the distribution of the odours, which can range from almost sweet (deicing fluid) to sour (like vinegar) to natural gas-like (rotten eggs). The strength of the odours are reduced as EIA starts to treat the water and as warmer temperatures accelerate chemical reactions. Your patience and understanding is appreciated during that time.



Figure 3: Engineered wetland system