

# Searchmont ski resort gets a wastewater system facelift

### Canadian ski resort needed a replacement sewage system that would accommodate more people.

By Dennis F. Hallahan, P.E. and Chris Kresin, M.Sc. (Eng.), P.Eng.

One of the premiere ski resorts in Midwestern Canada, Searchmont has diverse terrain that offers challenging skiing and snowboarding. With the popularity of the resort growing, Searchmont identified the requirement to position itself to allow an increase in its guest facilities to accommodate increased visitation. The current on-site sewage system, comprised of a series of septic tanks and a disposal field, was operating beyond capacity and the resort had been pumping and hauling septic effluent in order to accommodate the sewage flows generated by the resort. A new disposal field or an expansion of the existing disposal field was necessary in order to accommodate the existing sewage flows, and increased flows from the new facilities program and install the system in a timely fashion to ensure the resort opened for the December ski season kickoff.

The mountain location and resort footprint contributed to a lack of available suitable land for a new disposal field sized according to regional guidelines. The engineering firm working with the resort, Kresin Engineering Corporation, was tasked with identifying a solution that would allow them to utilize the same location as the original on-site sewage system. Kresin proposed that the system be reconstructed in its original location and that it include an increase in septic tank capacity; maximize the use of existing sewage balancing tanks; and incorporate a reconstructed disposal field.

The original system possessed inadequate treatment volume (septic tank capacity) and disposal field area. Several options were considered including replacing septic tanks with advanced treatment units to reduce required disposal field length or a surface water effluent dis-

charge. Ultimately, the selected approach was to better treat and dispose of the generated sanitary sewage through the provision of increased retention time in septic tanks. Due to significant flow variability between seasons, advanced treatment was not a viable option. Increased disposal field capacity was also not an option due to space constraints. The selected design would accommodate the increase in average daily design flow of the system to



Because of the mountain location and lack of available suitable land, chambers were used for the new disposal field.

97,000 litres/day with a maximum flow of 169,000 litres/day. A 73,300-litre septic tank volume was designed into the new system with balancing tanks providing an additional 125,000-litre storage volume. In addition, system operations were improved through the use of automated controls to control disposal field dosing and pumping effluent that overflowed to the balancing tanks back to the on-site sewage system for disposal during periods of low-flow.

The re-constructed system received Ontario Ministry of Environment (MOE) approval as a large on-site sewage system. Ontario regulations specify that all on-site

sewage systems under 10,000 litres/day be designed under the requirements of Part 8 of the Ontario Building Code (OBC). Onsite wastewater systems over 10,000 litres/day are required to be engineered and approved by the MOE.

Infiltrator Systems Inc.'s Standard H-10 Chambers were chosen in place of the original pipe and stone disposal field because of their ability to accommodate disposal field reductions of up to 50 percent

with equal or better performance than stone systems, and to store effluent within the chambers allowing percolation over a greater period of time than traditional disposal fields. Ease of installation, cost effective treatment and the minimal amount of required maintenance and servicing, which would eliminate the worry of scheduled maintenance during the busy ski tourist season and adventure outfitting in the off-season, also supported the specification of this system.

"The advantages provided by the Infiltrator H-10 Chambers allowed us to meet Provincial MOE approval requirements for

an on-site sewage system disposal field while working within the space-limited site," says Chris Kresin, consulting engineer from Kresin Engineering Corporation, Sault Ste. Marie, Ontario.

Chambers were constructed in beds over an area that included native material as well as fill material. Installation began in November at the onset of winter. Due to the quick and easy installation of the chambers, the project was completed in a short period of time and the complete system was fully functional for the December ski season kickoff.

This project was MOE approved to accept 1,440 metres of the 34-inch wide Standard H-10 Chamber as a replacement to 2,880 metres of conventional four-inch pipe and stone beds. This represents a 50 percent reduction in length. Septic tank effluent is introduced to the disposal field through a dosing tank, which receives effluent from a submersible pump located in a pump tank. The field is comprised of six individual pods each having eight runs of Standard H-10 Chambers, which receive effluent based on their available capacity.

The system was completed in time for the ski season and is currently functioning well with no reported disposal field capacity problems or operational issues to date. Operation and maintenance of the system is minimal and generally limited to ensuring float switches are unobstructed, and periodic checks of balancing tank and dosing chamber liquid levels. General operation is carried out by Resort maintenance staff. During the off-season periods, they also determine the need for septic tank clean out.

#### Infiltrator Systems Inc.

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Infiltrator chambers were installed over an area that included native material as well as fill material.