By Alexandra Skinner-Reynolds

Under cover

It's a dirty job — and some don't have to do it anymore — thanks to a new device designed to protect workers in manholes from unsafe encounters underground.

You are in a dark underground room that smells like garbage and human waste. Surrounded by concrete walls, you trudge through muck, your flashlight trained like a beacon on the used needles littering the path in front of you. Grasping metal tongs, you fish out dozens of exposed syringes from the sludge beneath you and all around you, dropping them one by one into a sharps disposal container.

Once the needles are gone, an industrial cleaning company power washes the area and pumps out any remaining biohazardous waste.

Now you can begin your work — repairing telecommunications wires. You are a utility worker, and this is your office.

Fifteen years ago, Tina Thompson's husband came home from his "messy office" one day with a hypodermic needle stuck in his boot. Luckily, he was unharmed. But Thompson was surprised to learn that utility workers like her husband are continually exposed to biohazardous waste — dumped into their workspaces through the two small openings atop manhole covers.

Today, Thompson is the founder of MUG Solutions and inventor of the patented MUG Flap, a device that blocks waste — specifically syringes — from entering underground workspaces.

The design is seemingly simple, consisting of three parts: a steel housing component welded to the underside of the manhole lid, a spring, and a steel flap with a bubble. When the device is in place, it blocks entry of unwanted debris into the openings on manholes. To gain access to the manhole, utility workers insert removal hooks to depress and release the spring-loaded steel flap.

The search for the perfect plug

The idea for these protective devices took shape in the summer of 2006. Thompson was on maternity leave and looking for a home-based business. At the same time, she was intrigued by the media attention surrounding the needle exchange service for drug users on the downtown eastside. "My husband said the problem of dirty manholes had gotten worse," she says. "I thought, 'I'm looking for a business to start, and I see the need for a solution.'"

Thompson was able to draw upon her skills from a previous career in information technology, "I am naturally analytical, so I spent the next four to five months looking for existing solutions, performing patent searches, and working on early prototypes."

In 2007, Telus Communications agreed to conduct a trial run using Thompson's product. Ten manhole covers in the back alleys of the downtown eastside received a thorough cleaning and pressure-washing, and then Thompson's MUG flaps were installed on half of them.

Thirty days later, utility workers pried open all 10 lids. Five of the manholes

At left, Tina Thompson displays the MUG Flap, a device designed to protect utility workers from exposure to biohazardous materials in manholes. Above, standard manhole covers allow the entry of everything from used needles to human waste.

"It provides an engineering solution to a problem we've been fighting for years"

— John Leighton, Telus outdoor maintenance technician

containing Thompson's protective devices were needle-free and, she adds, "looked like they had been pressure-washed that morning." The manholes without the devices contained 519 used needles, eight crack pipes, and plenty of other waste. Manholes included in a control group neither cleaned nor fitted with the device held too many needles to count.

WorkSafeBC occupational hygiene officer Gordon Harkness says the risks for manhole workers are serious. "If they are stuck, they can be exposed to blood-borne pathogens, including HIV and Hepatitis B and C."

Harkness says that exposed workers may face the prospect of a "gruelling-but-necessary" antiviral treatment and six months of medical monitoring, along with the strain of worrying about whether or not they've been infected.

Yet, as Harkness points out, the absence of needles in workspaces can spare workers the health scare, while employers reduce their overall clean-up costs. "Without these devices, employers have to put together far more elaborate exposure control plans — that include provisions for cleaning and disinfecting contaminated areas — in order to deal with discarded syringes," he says. Harkness calls such a process "time-consuming and expensive."

According to Andrew Ross, acting manager of health and safety for the City of Vancouver, "many employers have workers in telecommunications manholes" and he considers Thompson's device specifically beneficial to these workers.

"It's a phenomenal improvement," says John Leighton, the outdoor maintenance technician who oversaw the Telus trial. "It provides an engineering solution to a problem we've been fighting for years. In the areas where they're installed, workers love it; it really mitigates a hazard."