



"Being an airfield location, a lot of detailed planning went into managing this South Runway Watermain Inspection. We stuck to the schedule, met all milestones, and were extremely pleased with the execution of the safety plan, which was critical in this restricted environment." **Stephen Little**, Program Manager, Vancouver International Airport.

Case Study:

VANCOUVER INTERNATIONAL AIRPORT, VANCOUVER, B.C.

Pipeline inspection to manage the critical watermain for a busy international airport takes months of proactive planning, safety and scheduling.

- Sahara® leak and air pocket assessment
- CCTV live video inspection
- 1-day mobilization and inspection

Program Highlights

- ✓ **870 M (2850 FT.)** total distance inspected
- ✓ **ZERO (0)** leaks and **ZERO (0)** air pockets identified
- ✓ Inspection determines **PIPELINE ALIGNMENT** with all bends and 100 m intervals marked
- ✓ **CCTV** shows small **TUBERCULATION** on metallic bends
- ✓ Old meter **UPGRADED** to ultrasonic model

PIPE MATERIAL	INSPECTION LENGTH	DIAMETER	TRANSMISSION TYPE
Asbestos Cement	870 m (2850 ft.)	350mm (13-inch)	Water



In the management of a major international airport like Vancouver International Airport (YVR), Vancouver Airport Authority (VAA) operation officials inevitably face a number of unique challenges. Compounding the challenges is the fact that the island airport runs as a mini-municipality within the jurisdiction of the City of Richmond.

In 2017, VAA engaged Pure Technologies to perform a Sahara® leak and air pocket detection inspection on the South Runway Watermain (SRW). Built in 1966, the SRW is a 350mm water main constructed of asbestos cement that runs from the Airport Field Bulk Water Meter to the South Domestic Terminal for approximately 870m (2850 ft.).

The water line provides an important service to both the South Terminal and leased buildings, and multiple aircraft maintenance facilities. The line runs along the main airfield, and across some taxiing areas. Failure is not an option. The airport receives water from the City of Richmond, which was also keenly interested in the inspection outcome.

CHALLENGE:

When carrying out a water main inspection in an airfield location, strict rules apply to the operation. A well-executed inspection requires dedication to planning, safety, and scheduling.

The main purpose of the survey was to identify and accurately locate any leaks or air pockets using the acoustic capabilities of the Sahara leak detection tool. VAA also wanted visuals from inside the pipe using the video capabilities of the tool's CCTV camera. VAA also wanted to map the bends in the line and take GPS coordinates at select points to update alignment plans.

Another important purpose of the inspection was to eliminate water loss at the airport, a goal initiated by management as part of a proactive environmental program to conserve water. YVR receives water from the City of Richmond via several bulk meter locations. From here, VAA distributes the water throughout Sea Island. The presence of leaks would have an adverse effect on the airport reaching its water reduction targets.

SOLUTION:

Pure Technologies recommended the **Sahara leak detection platform** for its ability to provide same-day results, and to locate small leaks with sub-meter accuracy. The tethered tool is propelled by a small parachute inflated by the product flow.

Because the inline tool is tethered, an operator has complete control, and can closely examine events of interest such as leaks, air pockets and visual anomalies in real time.

The Sahara platform also features inline video that allows operators to observe internal pipe conditions, and in many instances, identify the type of leak and other details helpful for planning a repair before excavating.

Although this first project was limited in scope and budget, because of the criticality of the line, both Pure Technologies and VAA put extra care and planning into efforts to ensure a relatively effortless access and retrieval of the condition assessment tool.



RESULTS:

The adaptable design of the Sahara tool allowed for a horizontal insertion (vertical more common) at the water meter chamber and the inspection was completed under live conditions without disruption to service, using the water meter bypass and downstream fire hydrants.

In a single day, the Sahara crew inserted the tethered tool through the water meter chamber, inspected approximately 870 meters (2850 feet) and determined the pipeline alignment with all bends and 100-meter intervals marked. In conjunction with the inspection, VAA and the City of Richmond were able to upgrade the old water meter to an ultrasonic unit, a bonus to the inspection goals.

In the end, **zero (0)** leaks and **zero (0)** air pockets were identified during the inspection, and CCTV showed some small tuberculation on the metallic bends. Although VAA recognized no immediate concerns, the Airport Authority is further ahead, and now knows the correct updated line location and the overall condition of their assets.

The City of Richmond assisted by removing their aging water meter and installing the flange supplied by the Sahara team for the launch of the tool. The City then took the inspection opportunity to upgrade the old meter to a newer ultrasonic model.

As the line was located in the airfield, maintaining the inspection schedule was critical. Security escorts were required at all times for non-YVR employees, which meant scheduling for the project was booked nearly five months in advance.

As well, the inspection was a multi-jurisdictional project, as the pipeline was owned by both the City of Richmond and VAA, requiring close collaboration between all parties. Pure Technologies inserted the tool via the City of Richmond's water meter (in the airfield) and inspected the downstream water main (owned by VAA).