

# TRIDENT

GROUP CANADA



## INTRO

### Specialist Wastewater, Clean Water, Stormwater & Digital Water Advisory

Trident Group Canada Inc. is a specialist Canadian consultancy focused on helping municipalities and utilities plan, operate, and optimise their wastewater, clean water, and stormwater systems, supported by advanced digital and analytics capabilities. We draw on decades of front-line experience in the UK water sector one of the most heavily regulated environments globally combined with a clear understanding of Canadian utility governance, climate, and growth pressures.

Our work supports Canadian clients with technically robust hydraulic modelling, network analysis, and digital decision-support across collection, distribution, and drainage systems. We understand how Canadian municipalities make decisions, how provincial requirements and asset management expectations shape investment, and how to adapt established international best practice to local conditions rather than applying it “off the shelf.”

Trident Group Canada is supported by a broader family of Trident specialist companies in the UK, spanning wastewater modelling, clean water and stormwater network engineering, and intelligent digital solutions. This extended network supplements our Canadian team’s capabilities with additional depth and proven approaches, while all Canadian utility engagements are led, structured, and delivered by Trident Group Canada to align with local standards, expectations, and ways of working.



### Our Approach

We prioritise accuracy, transparency, and collaboration across every discipline. Our work is underpinned by robust QA frameworks and clear documentation, ensuring models, analyses, and digital tools are traceable, repeatable, and suitable for technical review and peer challenge.

We do not follow the traditional, graduate-heavy consulting model. Project teams are lean and specialist, built around seasoned subject matter experts in hydraulic modelling, network operations, and digital engineering. The people you meet at the outset are the people who do the work bringing senior-level thinking directly to your project rather than delegating delivery to large junior teams.

Our style is pragmatic and collaborative. We spend time understanding how your systems are actually operated, how data is captured and used, and how decisions are made within your organisation. From there, we tailor our wastewater, clean water, stormwater, and digital services so that outputs are not only technically sound but also usable by Canadian operations, planning, and leadership teams.

We deliver an integrated suite of services across wastewater systems, clean water networks, stormwater and drainage systems, and digital water enablement, trusted by municipalities, utilities, consultants, and infrastructure partners combining international pedigree with an approach grounded in the Canadian market.

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## CLEAN WATER

### Clean Water Network Modelling, Operations & Optimisation

At Trident Group Canada, our focus is supporting water sector clients with the technical challenges involved in delivering a safe, reliable, and high-quality drinking water service. Network operations form the backbone of water service delivery and include the operation, maintenance, and optimisation of infrastructure that conveys water from source to customer.

Subject matter experts at Trident bring extensive experience across key aspects of clean water network performance, including network management, pressure regulation, leakage analysis, water quality support, incident response, and compliance with drinking water requirements. We support clients operating within Canadian provincial regulatory frameworks and municipal governance models, where accountability for water quality, service levels, and environmental protection rests with system owners and operators.

### Clean Water Network Operations & Performance Support

Trident Group Canada supports clean water network management through the application of hydraulic modelling, operational data analysis, and engineering expertise. Our team includes practitioners with direct experience working within water utilities, enabling a practical understanding of the operational challenges faced by network teams.

We support clients in addressing pressures from climate variability, demand growth, and leakage by applying advanced modelling techniques, analytics, and data-led approaches. Our work helps utilities better understand network behaviour, assess performance risks, and improve operational resilience.

### Network Management & Operational Data Systems

Clean water network management involves the day-to-day operation of pipelines, valves, pumps, reservoirs, and service connections. Trident staff support the use of existing monitoring and data systems to assist operational teams and improve network understanding.

We leverage operational data systems including:

- SCADA, providing real-time information on flow, pressure, and system status
- GIS, supporting asset mapping, performance tracking, and maintenance planning

By integrating these data sources with engineering analysis, Trident supports root cause analysis of incidents, recurring issues, and performance constraints, aiding operational optimisation.

### Clean Water Network Design & Configuration

Effective network design is fundamental to reliable clean water service. Trident applies its experience in network configuration to support the planning and optimisation of pumping stations, reservoirs, control valves, and associated control systems.

We have supported solution development for clean water networks by contributing hydraulic insight to design teams, helping ensure that systems meet service objectives while operating efficiently under a range of demand and operating conditions. This includes the application of advanced analytics and data-driven tools to provide insight into asset performance and early warning of emerging issues.

### Pressure Management & DMA Design

Effective pressure management is essential to maintaining service levels while minimising stress on network assets. Excessive pressure can increase leakage and burst frequency, while insufficient pressure can impact customer service.

Trident works with clients to support the design and operation of pressure management systems aimed at improving network performance and asset longevity. This includes:

- Review and optimisation of District Metered Area (DMA) layouts
- Support for pressure control strategies using PRVs, variable speed pumps, and control logic
- Application of advanced pressure management techniques to balance service, leakage reduction, and energy efficiency

Trident also provides technical advice on the specification and application of control, pressure reducing, and air valves to suit operational requirements.



### Leakage Analysis & Reduction Support

Leakage remains a significant challenge for water utilities. Trident Group Canada applies a range of leakage analysis techniques, including flow analysis, hydraulic

modelling, pressure assessment, and the use of smart sensor data to support leak identification and prioritisation.

Our team applies data-driven and AI-enabled techniques to identify trends, higher-risk areas, and non-visible leakage. We work with operational and asset teams to interpret data, support prioritisation of investigations and repairs, and incorporate customer-reported information into analytical workflows.

Service Reservoir Modelling & Water Quality Support

Service reservoirs play a critical role in balancing supply and demand and maintaining water quality. Effective design, inspection, and maintenance are essential to managing water age and preserving hygiene.

Trident Group Canada includes specialist CFD modellers who use ANSYS CFX / Fluent to provide detailed visualisation of hydraulic behaviour within reservoirs, tanks, fittings, and pipework. CFD modelling illustrates flow paths, velocity distribution, and areas of recirculation that may contribute to elevated water age.

We support clients with planning for reservoir inspections and cleaning by assisting with the development and coordination of temporary bypass arrangements, enabling works to proceed while maintaining supply and minimising customer impact.

Clean Water Hydraulic Modelling

Trident Group Canada has extensive experience in hydraulic modelling of potable water networks. Our team has worked with all major industry software platforms, including InfoWorks, Synergi, Bentley tools, and EPANET.

Hydraulic models are used to support:

- Strategic and long-term planning
- Operational optimisation
- Incident response and contingency assessment
- Demand forecasting and growth assessment
- Evaluation of network resilience and outage scenarios

Modelling is also applied to assess the impacts of new developments, trunk main failures, or source outages, and to test mitigation options.

Surge & Transient Analysis

Trident provides surge and transient modelling services to understand and mitigate pressure-related risks within clean water networks. Surge analysis is used to assess the causes of bursts and pressure events and to develop implementable mitigation measures tailored to client systems.

Our analysis supports safer network operation by identifying transient risks and evaluating protection measures appropriate to system configuration and operational practice.

Incident Response & Event Analysis

Trident Group Canada has experience supporting utilities during network incidents such as main breaks, contamination events, or equipment failures that require rapid response to protect public health and service continuity.

Our modellers support operational teams by working alongside control room, operations, and water quality staff to assess system behaviour during incidents and reduce customer impact. Data-driven approaches, including analytics and AI-based early warning techniques, are used to identify emerging issues and support response planning.

Trident also supports the development and review of Incident Response Plans (IRPs) and conducts post-incident analysis to help utilities understand causes and improve future resilience.

Supply Interruption Analysis & Reporting Support

Trident supports utilities with post-event analysis following supply interruptions. Using hydraulic modelling and data analysis, we assist with quantifying the extent and duration of interruptions and assessing system response.

This work supports internal performance review, reporting, and identification of improvement opportunities.

Planning & Investment Support

Trident subject matter experts support clients with technical input to planning and investment processes by providing evidence-based analysis of network performance, leakage trends, asset health, and system resilience.

Our contribution focuses on providing robust technical insight derived from modelling and analytics to inform longer-term planning, risk assessment, and prioritisation of interventions.

CLEAN WATER  
Summary

“Clean water network operations are fundamental to public health and community wellbeing. As utilities face increasing challenges from climate change, population growth, and ageing infrastructure, Trident Group Canada is committed to supporting clients through robust engineering analysis, data-driven insight, and collaborative working.

Our focus is on delivering technically sound support that helps utilities operate, maintain, and plan clean water networks that are safe, reliable, and resilient.”



## WASTE WATER

### Wastewater Hydraulic Modelling & Verification

Trident Group Canada supports clients with the development and calibration of high-quality hydraulic models that accurately reflect the performance of wastewater networks. Using software such as InfoWorks ICM, models are built by integrating asset data, topography, flow surveys, and rainfall records, ensuring connectivity and structural issues are resolved. Model verification is undertaken using observed flow and rainfall data. Parameters such as roughness, infiltration, and storage are refined to align model outputs with observed system behaviour. Verification also draws on known historical incidents, including flooding or pollution events, to confirm model reliability.

Models are developed in line with recognised industry guidance and are suitable for use in catchment studies, capital scheme support, and technical reporting. A robust, verified model provides a sound foundation for wastewater network assessment and planning.

### Flow Monitoring & Rainfall Survey Programmes

Accurate flow and rainfall data are essential for building and verifying reliable wastewater models. Trident Group Canada works with clients to design and manage bespoke monitoring programmes tailored to individual catchments.

Surveys are scoped by identifying key locations based on hydraulic significance, known performance issues, and network topology. Monitor types, locations, and durations are specified to capture representative dry- and wet-weather conditions.

Trident oversees delivery, including contractor liaison, quality assurance, and data validation. Robust checks are applied to ensure high data return rates and reliable datasets, supporting confident model calibration and reducing uncertainty.

### Long-Term Wastewater & Catchment Planning Support

Trident Group Canada supports long-term wastewater planning through catchment-based studies underpinned by hydraulic modelling and data analysis. We help clients understand current and future system performance risks, considering factors such as population growth, climate change, urban creep, and asset deterioration.

Our work identifies higher-risk areas, tests intervention scenarios, and provides technical evidence to support prioritised investment planning. By combining modelling expertise with regulatory awareness, we support the development of resilient, future-ready wastewater strategies.

### Flooding, Surcharge & Pollution Risk Assessment

Trident Group Canada assesses flooding and pollution risk using hydraulic modelling to simulate wastewater network performance under current and future conditions. We help clients understand the effects of storm events, system limitations, and climate change on flooding, surcharge, and overflow operation.

Our work identifies risk locations, quantifies system response, and tests mitigation options including storage and operational control. Outputs support technical reporting, resilience planning, and the development of targeted improvement measures.

### Capital Scheme Support & Optioneering

Trident Group Canada supports the development of wastewater capital schemes by translating hydraulic model outputs into clear technical insight. We help clients understand root causes of performance issues, define performance requirements, and explore feasible interventions through scenario testing and sensitivity analysis.

Our work supports solution optioneering, outline design development, and cost-benefit assessment, ensuring proposed schemes are technically robust and supported by modelling evidence.



Smart Wastewater Networks & Real-Time Control

Trident Group Canada designs and supports smart wastewater network solutions using real-time control (RTC) and AI-enabled optimisation. We help clients improve system performance, reduce overflow activations, manage hydraulic stress, and make better use of existing capacity.

Control strategies are developed using hydraulic models, telemetry data, and predictive analytics. Assets such as gates, pumps, and storage are configured to respond dynamically to forecast conditions, supporting proactive system operation and improved resilience.

Development Impact & Capacity Assessment

Trident Group Canada assesses the impact of proposed developments on existing wastewater networks. We carry out developer-funded modelling to evaluate additional flows, identify capacity constraints, and test mitigation measures.

Assessments support planning and development processes by providing technical evidence to inform infrastructure requirements and network upgrades, helping balance growth with sustainable wastewater system performance.

Independent Model Audit & Quality Assurance

Trident Group Canada provides independent wastewater model audits and quality assurance services. Reviews assess model structure, data inputs, calibration, and documentation against recognised industry best practice.

Audits support internal assurance, technical review, and third-party validation. We identify gaps, recommend improvements, and support consistency and transparency in modelling outputs.

Wastewater Infrastructure & Transient Analysis

Trident Group Canada provides expert support for the design, analysis, and optimisation of wastewater infrastructure, including pumping stations, rising mains, treatment assets, and storage systems.

We specialise in the assessment of pressurised rising mains, including detailed transient (surge) analysis. Operational scenarios such as pump starts and stops, power failure, filling, and draining are simulated to assess pressure response and system resilience. Advice is provided on air valve placement and specification to manage transient risk.

Infrastructure assessments also include:

- Control philosophy and pump operation
- Wet well sizing and discharge arrangements
- Treatment capacity, flow balancing, and storm handling
- CSOs, siphons, storage, and control structures

By combining hydraulic modelling with engineering judgement, Trident supports safe, efficient, and resilient wastewater system design.

WASTE WATER  
Summary

“Wastewater operations are central to service delivery and environmental protection. As pressures increase from climate change, population growth, and ageing infrastructure, Trident Group Canada is committed to supporting clients through robust modelling, careful analysis, and collaborative working.

Our focus is on delivering reliable technical insight that supports effective wastewater system planning, operation, and long-term performance.”

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## AI & DATA

### Digital, Analytics & Intelligent Systems for the Water Sector

The water sector faces increasing pressure from ageing infrastructure, evolving regulatory expectations, population growth, and climate variability. Utilities must maintain reliable service while managing cost, risk, and environmental impact within constrained operating environments.

Trident supports water utilities by applying data analytics, software engineering, and digital tools to improve system understanding, operational efficiency, and resilience. Our services focus on enabling better use of existing data and systems to support informed decision-making, modernise legacy platforms, and reduce reliance on manual, error-prone processes.

### Bespoke Software Engineering for Water Utilities

Trident Intelligent Solutions delivers bespoke digital solutions tailored to the operational realities of water utilities. Our developer-led approach ensures that software is designed and built by engineers who understand utility systems, data flows, and operational constraints.

We develop secure, robust applications that integrate with existing infrastructure, including field data collection tools, operational databases, and dashboards. Our work supports practical use by control room staff, field teams, and planners, with an emphasis on usability, reliability, and maintainability.

### Legacy System Modernisation

Many utilities rely on legacy systems that remain operationally critical but are increasingly difficult to maintain or integrate. Trident supports the assessment and modernisation of these systems to improve reliability, performance, and compatibility.

Our work includes:

- Reviewing existing codebases to identify technical debt and operational risk
- Refactoring and stabilising legacy applications
- Migrating systems to modern, cloud-ready or hybrid architectures where appropriate
- Introducing APIs to improve interoperability

Modernisation is carried out in a controlled manner to minimise disruption to live operations.

### Bespoke Applications & System Integration

Off-the-shelf software often cannot fully address the domain-specific needs of water utilities. Trident builds bespoke applications to support challenges such as burst risk monitoring, asset performance tracking, and coordination of field activities.

Our applications integrate with systems such as SCADA, GIS, telemetry platforms, and enterprise databases to create connected digital environments. Solutions are developed collaboratively with users to ensure they align with operational workflows and real-world constraints.

### Process Automation & Workflow Support

Manual processes remain common in areas such as data handling, reporting, and performance tracking. Trident supports utilities by automating repeatable tasks using scripting, APIs, and workflow tools that connect existing systems.

Automation supports activities such as:

- Performance and operational reporting
- Asset monitoring and exception handling
- Inspection scheduling and data processing

These tools reduce manual effort, improve consistency, and support scalable operations without requiring wholesale system replacement.

### Data Science & Advanced Analytics

Trident applies data science and advanced analytics to help utilities better understand system behaviour and performance trends. Our team includes specialists in statistics, machine learning, and optimisation who work with operational data to develop practical analytical tools.

We deliver analytical solutions covering areas such as:

- Forecasting and trend analysis
- Anomaly detection
- Asset performance assessment
- Operational optimisation

Solutions are designed for real-world deployment, with appropriate monitoring, documentation, and maintainability.

## Machine Learning & Predictive Modelling

Trident develops machine-learning tools that support predictive analysis in operational environments. Models are built to address use cases such as burst likelihood assessment, pump failure risk, telemetry fault detection, and prioritisation of interventions.

We support the full lifecycle of predictive tools, including:

- Model development and validation
- Deployment into operational systems
- Monitoring and retraining workflows

Our focus is on reliability, transparency, and practical usability rather than experimental or proof-of-concept outputs.

## Data Quality Assessment & Improvement

Reliable analytics depend on reliable data. Trident supports utilities by auditing datasets for completeness, accuracy, consistency, and validity. We identify issues such as sensor drift, incorrect mappings, missing metadata, or inconsistent structures.

Recommendations focus on practical improvements to data pipelines, including reprocessing, metadata enhancement, and optimisation of ETL workflows to improve confidence in operational and analytical use.

## Optimisation & Decision Support

Trident applies optimisation techniques to support efficient use of resources and infrastructure. Using analytical models, simulation, and operational data, we support optimisation activities such as:

- Pumping and energy use
- Field crew and tanker routing
- Balancing capacity, demand, and operational risk

Optimisation tools are designed to integrate with existing systems and to support practical operational decision-making.

## IT Delivery & Digital Enablement

Trident provides IT delivery support for water utilities undertaking digital improvement initiatives. Our team includes experienced engineers and project practitioners who deliver secure, scalable solutions aligned with operational needs.

We support:

- Design and delivery of digital platforms
- Integration of new tools into existing environments
- Governance-aware project delivery
- Alignment with utility IT standards and policies

Where cloud services are adopted, we support secure implementation using platforms such as Microsoft Azure, with attention to performance, data protection, and operational resilience.

## IT Project Management

Trident provides project management support for complex digital and IT initiatives within the water sector. Using structured delivery approaches, including agile and hybrid methodologies, we help manage scope, risk, and stakeholder engagement across the project lifecycle.

Our focus is on maintaining delivery momentum while ensuring technical quality, operational compatibility, and user adoption.

## Cybersecurity Support

Trident supports utilities with cybersecurity assessment and improvement across IT and operational technology environments. Our work includes identifying vulnerabilities, reviewing system configurations, and supporting the implementation of appropriate controls.

Cybersecurity services support:

- Risk identification and mitigation
- Secure system architecture
- Incident preparedness and response planning

All work is undertaken with an understanding of the operational availability requirements of water utilities.

## Cloud & Digital Infrastructure Support

Trident supports utilities in adopting cloud and hybrid infrastructure to improve scalability, accessibility, and system integration. We assist with the design, build, and operation of cloud environments that support data ingestion, analytics, and application hosting.

Our approach emphasises controlled transition, security, and alignment with long-term IT strategies, with minimal disruption to operational systems.

## AI & DATA Summary

“Trident’s digital and analytics services are designed to support utilities in navigating the complexity of modern water system operation. By combining software engineering, data science, automation, and IT delivery, we provide practical tools that improve system understanding, operational efficiency, and resilience.”

Our focus is on delivering solutions that are technically sound, operationally appropriate, and sustainable within the governance and resource constraints of Canadian water utilities.”



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To discuss your needs or explore how Trident Group Canada can support your water utility, please reach out using the contact details below. Our team is ready to connect, answer your questions and tailor solutions to your unique challenges.

## C O N T A C T

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