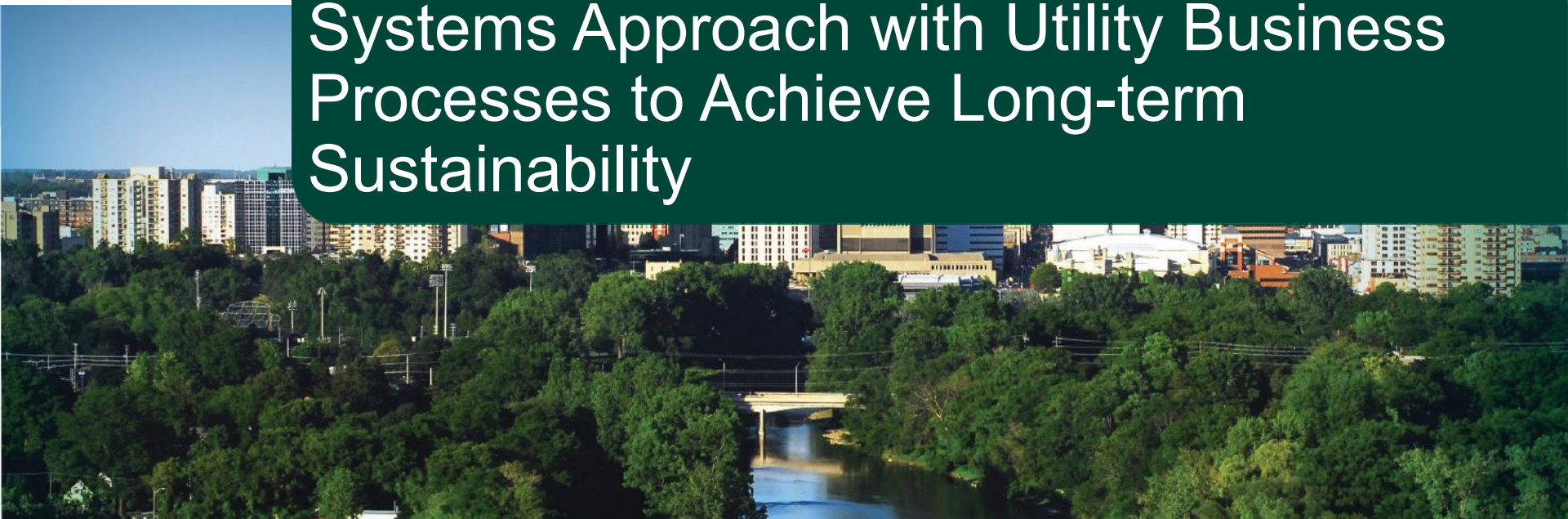




Incorporating an Integrated Management Systems Approach with Utility Business Processes to Achieve Long-term Sustainability



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Lake Huron & Elgin Area Water

Today's presentation:

- ✓ Background and history
- ✓ Organization
- ✓ Principles and practices
- ✓ Business processes
- ✓ What's next





Background & History

- Regional water systems previously owned/operated by Ontario:
 - Built and operated by Ontario Water Resources Commission (forerunner to the Ministry of Environment) in the mid-1960's
- *Municipal Water & Sewage Systems Transfer Act, 1997* - Ontario transfers provincially-owned water and/or wastewater systems to benefiting municipality.
 - Where a system benefitted more than one municipality, a Board of Management is established.



Background & History

- Ownership of the Lake Huron Water Supply System and Elgin Area Water Supply System (regional water systems) transferred to respective benefiting municipalities in 2000 via Transfer Order:
 - Each municipality has an undivided interest in the respective system
 - No division of capacity. No division of ownership. No shareholdings.
- Transfer Order created a Board of Management for each system and has complete authority to govern.



Background & History

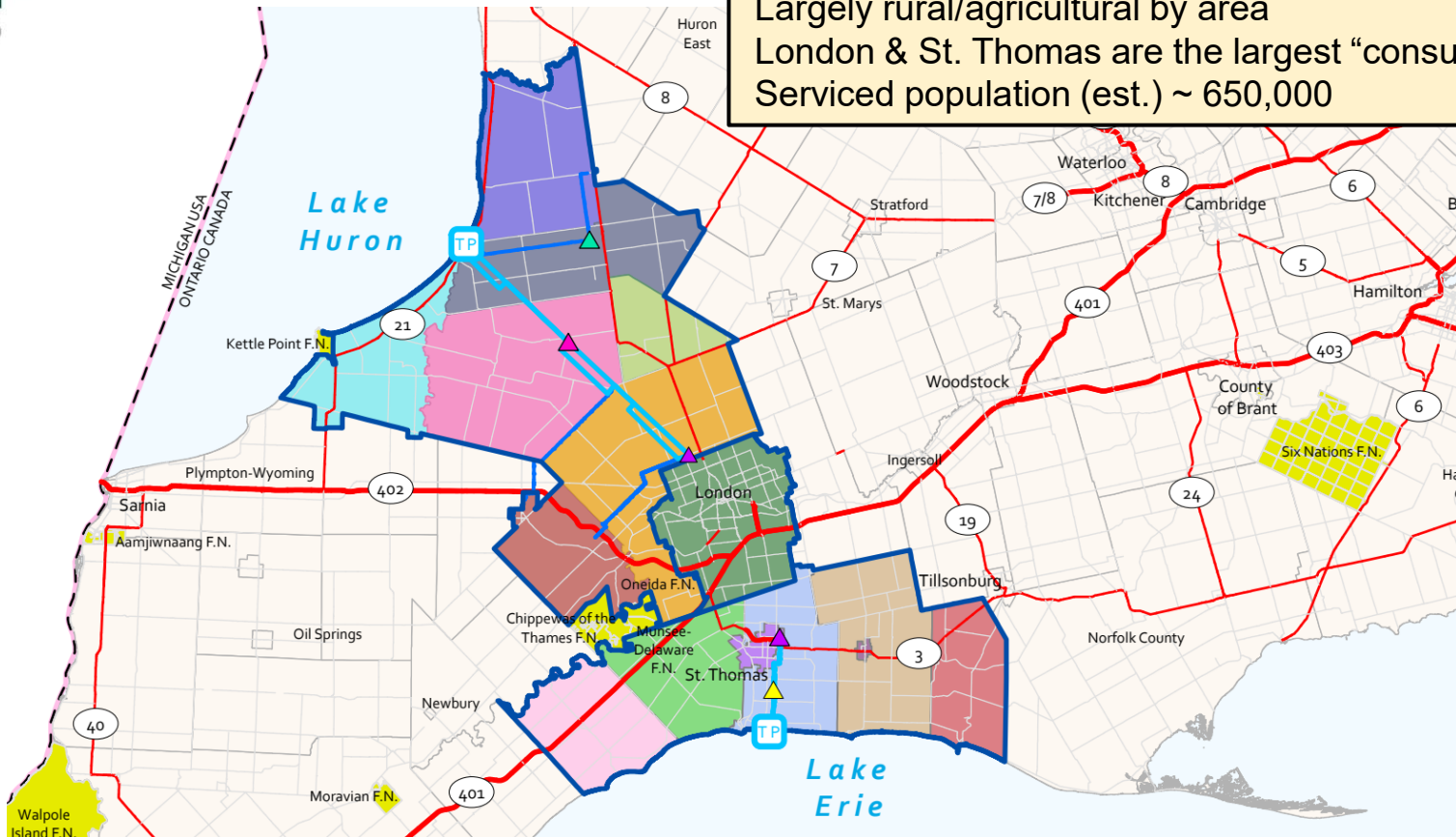
“ You’re a Board now. You’re on your own. Go forth and be plentiful...”

*“ Here are the assets (**such as they are**) and all the debt (**as much as it is**)...”*

“ ...but no cash and no reserve funds... and no policies... or staff...”

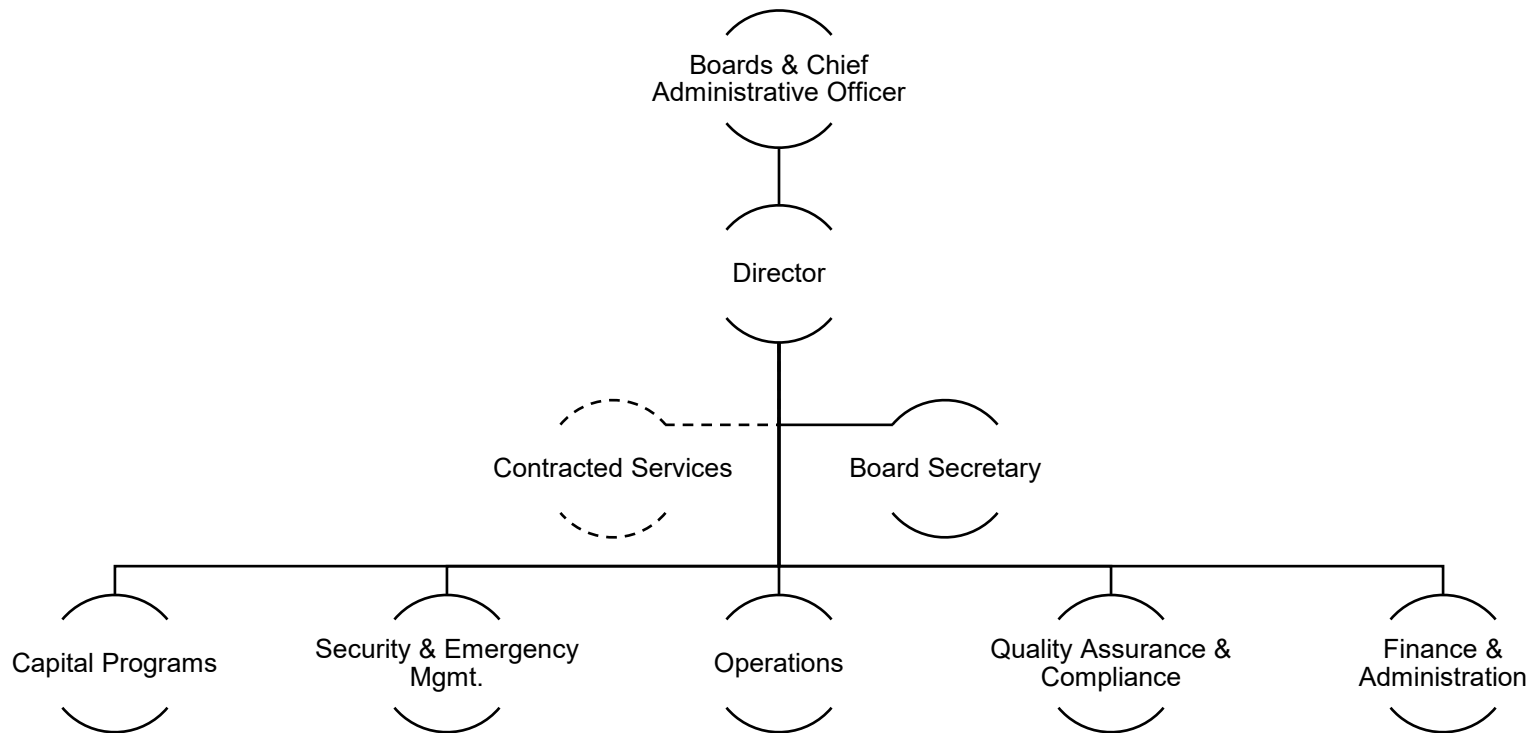
“ Good Luck! ”

~ 5,000 km² service area
Largely rural/agricultural by area
London & St. Thomas are the largest “consumers”
Serviced population (est.) ~ 650,000





The Organization (by function)





The Organization (by function)

Security & Emergency Management:

- Incident Management System
- Security Services (contracted)
- Access Control Systems

Capital Programs:

- Planning & Studies
- Engineering & Construction
- Optimization & Efficiency

Finance & Administration:

- AP/AR, Audit & Finance Planning
- Procurement
- Legal Services (contracted)
- People Services & Safety

Operations:

- IT / Cyber Security
- Asset Management System
- OT / Control Systems
- Operating Authority (contracted)
- Energy Management (contracted)

Quality Assurance & Compliance:

- Audit
- Lab Information System
- Quality Management System
- Environmental Management System



Principles & Practices: Systemic Approach

Admin/Oversight using management system approach:

- **Quality management** to minimize risks to the operation of the system and the quality of the drinking water (DWQMS)
- **Environmental management** to minimize risks related to the environment & legislation, optimization of resource utilization, and minimize waste (ISO 14001)
- **Incident management** to coordinate response to incidents and emergencies and mitigate associated risks (JIBC/NIMS)
- **Asset management** to minimize risks to the assets, and coordinate the timely investment in the water system's assets accounting for condition, performance and risk (ISO 55001)



Principles & Practices: Systemic Approach

- Document control systems to ensure information is up to date, protected, accessible and readily retrievable.
- Internal and external audits undertaken to identify areas of risk, non-conformance and opportunities for **continuous improvement**.
- Integration of future management systems and plans
(e.g., CSA/ISO 45001 health & safety, ISO 31000 risk management, CSA z-1600 business continuity)



Four Primary Plans (a.k.a. “the four pillars”)

Master Water Plan:

- Growth management and planning
- Long-term projections of population and industries within municipalities
- Long-term projections of volumes supplied
- Infrastructure needed to support growth
- Water Quality Facility Plan (annex study)
 - Effectiveness of treatment at higher rates of flow
 - Identify treatment bottlenecks
 - Identify emerging water quality issues (climate change, emerging contaminants, disinfection efficacy, etc.)



Four Primary Plans (a.k.a. “the four pillars”)

Asset Management Plan:

- Understanding asset condition, risks, performance and meeting intended use of existing infrastructure and systems (including IT and OT)
- Investment requirements to sustain appropriate levels of performance and condition, minimize/manage risks
- Identify interconnectedness of activities affecting condition and performance



Four Primary Plans (a.k.a. “the four pillars”)

Operational Plan:

Activities and resources necessary to:

- Meet current and future (growth) volumes
- Protect the quality of the product
- Maintain current and future asset condition and performance
- Meet Boards’ strategic initiatives



Four Primary Plans (a.k.a. “the four pillars”)

Financial Plan:

- Identification of funding necessary to:
 - Manage, maintain, and repair existing assets and operate the system (maintain LOS)
 - Support growth, including capital investments, optimization and improvements, meet pending regulatory changes (enhance LOS)
- Identification of policies necessary to:
 - Balance generational equity (current user rate(s), utilization of Reserve Funds, use of debentures, etc.)
 - Balance development growth versus existing consumers
 - Identification of special rates and charges for specific purposes
 - Balance system needs versus consequential impacts to municipalities

Risk Mitigation & Levels of Service

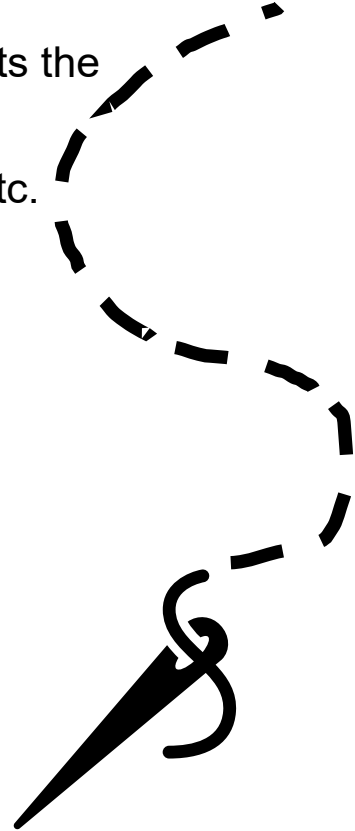
Customer Levels of Service and Risk Mitigation framework interconnects the management systems, policies, business processes and plans!

✓ Linked to prioritization, business case and decision-making processes, etc.

✓ CLOS supported by technical, operational and performance LOS

🔍 Focus on the concept of “customer”:

- Consumer (quality, volume, reliability, etc.)
- Environment (sustainability, resource consumption, waste generation, etc.)
- Staff (health & safety, workplace environment, etc.)
- Regulatory and contractual obligations
- Governance (including the benefiting municipalities)
- Reputation





Assessment Process

Prioritization

- Identify risks & opportunities
- Assess against CLOS
- Identify interdependencies



Business Case

- Problem Statement (objective)
- Assess options
- Identify CapEx & OpEx, lifecycle costs
- Identify operational impacts
- Identify residual risks



Approval & Implementation

- Financial model
- Budget
- Regulatory & contractual obligations
- Operationalize: changes to O&M Manual, documentation, permits/licence, SOPs, programs, etc.



Risk/Opportunity Prioritization

Capital Project Risk Assessment	
Planning Year:	2025
Business Case Title:	Intake Chlorine Line Replacement
1. Business Case ID#:	LH2025-
1. Sequential 3-Digit ID#:	021
Name of Project Initiator:	Mohammad Noor Tamim
Project Initiator's Email Address:	mtamim@huronelginwater.ca
Tuesday, June 11, 2024	
To Which Water System is this Business Case & Risk Assessment Applicable?	Lake Huron
Related and/or Predecessor Business Case or Project Numbers:	LH2025-012
Nature and Extent of the Problem Including a Description of the Risk: - Age of the line (end of life). - The Chlorine line has failed in 2 places on shore in 2015 and 2022. - The line from the plant to the beach chamber was replaced. The original line was found to be in poor condition.	
Project Type:	Design & Construction
Process Area:	Raw Water Handling
Has This Project Been Identified Through an Existing Study, Assessment, or Report?	No

- Automated form to generate assessment
- Drop-down, pick-list and free-form text to capture information
- Questions assess pre- and post-risks, failure modes, outcomes, implications to EMS, QMS, IMS, operations, CLOS, etc.
- Planning & review meeting with multi-disciplinary team to affirm risk/opportunity
- **Output:** Priority (rank)



Business Case

Capital Project Business Case

Planning Year: 2025

Business Case Title: Intake Chlorine Line Replacement

1. Business Case ID#: LH2025-

1. Sequential 3-Digit ID#: 021

Name of Project Initiator:

Project Initiator's Email Address:

Tuesday, June 11, 2024

To Which Water System is this Business Case & Risk Assessment Applicable?

Summary of the potential solution options considered to resolve the problem and the details of the recommended solution.

Is TAKING NO ACTION a Viable Option?

Benefits of Taking No Action:
No cost

Disadvantages of Taking No Action:
Inability to control mussels on intake leading to intake blockage and restricting plant operations

Financial Implications of Taking No Action:
Potential higher maintenance cost

- Automated form to generate assessment
- Drop-down, pick-list and free-form text to capture information
- Questions linked to EMS, QMS, Asset management, risk mitigation, CLOS and technical levels of service
- Initial assessment reviewed and validated (“challenge session”) by multi-disciplinary team
- Can identify other opportunities, interdependencies, etc.



Approval

Incorporate into Capital Plan:

- Assess implication to Reserve Funds, Debentures, operating/capital budgets
- Timing can be shifted based on interdependencies and prioritization assessment

Number	Name	Process Area	Risk/ Opportunity Score	Residual Risk	Status	BC-ID#	2021	2022	2023	2024	2025
LH1285	Pressure Reducing Valve Replacements	Primary - Pipes and Chambers			Approved			\$425,000			
LH1316-22	2022 Annual Maintenance Allowance	ALL	N/A		Approved	N/A		\$125,000			
LH1316-23	2023 Annual Maintenance Allowance	ALL	N/A		Approved	LH2022-016			\$125,000		
LH1316-24	2024 Annual Maintenance Allowance	ALL	10		Approved	LH2022-016				\$125,000	
LH1317	Distressed Pipe Replacement Program	Primary - Pipes and Chambers	20		Budget	LH2016-013b	\$350,000	\$350,000	\$400,000	\$350,000	\$350,000
LH1352	Ava Reservoir Structural Repairs	Primary - Reservoirs and Pumping Stations	10		Approved	LH2017-017			\$50,000	\$2,000,000	
LH1353	WTP - Administration Building Extension and Site Redevelo	General Site, Building Services, Fleet, and Security	12 32		Budget	LH2024-014			\$500,000	\$1,500,000	\$15,900,000
LH1380	Clarifier Upgrades	Pre-Treatment	6		Approved	LH2022-015		\$115,000	\$115,000	\$115,000	
LH1388	Coagulation Optimization Study	Pre-Treatment	N/A		Approved	N/A					
LH1408	Onsida Transmission Pipeline	Secondary - Pipes and Chambers	N/A		Approved	N/A		\$200,000	\$25,000,000		
LH1426	WTP Storage Reservoir & UV	Filtration, Disinfection, and High Lift Pumping	25		Approved	LH2018-004			\$500,000	\$3,000,000	
LH1900	Record Drawings and Documents	ALL	5		Approved	LH2017-007a					
LH1901	Water Quality Facility Plan	ALL	14		Approved	LH2019-002		\$290,000			
LH2036	Roof Drain Replacement	General Site, Building Services, Fleet, and Security	5		Budget	LH2022-003		\$50,000	\$25,000	\$25,000	\$25,000
LH2038	Chamber Flood Prevention/Rehab	Primary - Pipes and Chambers	15		Budget	LH2022-005		\$100,000	\$75,000	\$75,000	\$100,000
LH2042	Pipeline-A Double Isolation Valve	Primary - Pipes and Chambers	115		Approved	LH2021-008		\$1,247,000			
LH2043	Construction Site Trailer Pad & Electrical Pedestal	General Site, Building Services, Fleet, and Security	20		Approved	LH2022-002		\$75,000			
LH2044	Sub-basement Drain Study	Filtration, Disinfection, and High Lift Pumping	37		Approved	LH2023-001			\$25,000		
LH2045	Monitoring Station Controls Upgrades	Primary - Pipes and Chambers	37		Approved	LH2023-002			\$275,000		
LH2046	Asset Condition Field Assessment	ALL	6		Approved	LH2023-003			\$110,000	\$100,000	
LH2047	Electric Vehicle Charging Stations	General Site, Building Services, Fleet, and Security	7		Approved	LH2023-004			\$10,000		
LH2048	De-chlorination at Remote Stations	Primary - Reservoirs and Pumping Stations	190		Approved	LH2023-009			\$125,000		
LH2049	Office Expansion	ALL			Approved	N/A			\$100,000		
LH2050	Master Water Plan Update	ALL	9		Approved	LH2018-001				\$235,000	
LH2051	Service Water Study	Filtration, Disinfection, and High Lift Pumping	5		Approved	LH2024-004				\$120,000	
LH2052	McGillivray Building Renovations	Primary - Reservoirs and Pumping Stations	3		Budget	LH2024-004				\$25,000	\$25,000
LH2053	Climate Change Resiliency Assessment	ALL	16		Budget	LH2024-005				\$120,000	\$120,000
LH2054	Treatment Plant Surge System Rehabilitation	Filtration, Disinfection, and High Lift Pumping	25		Approved	LH2024-012				\$175,000	
LH2055	Beach Chamber Valve Replacement	Raw Water Handling	5		Approved	LH2024-007				\$400,000	
LH2056	Clarifier Ramp Replacement	Pre-Treatment	15		Approved	LH2024-008				\$280,000	
LH2057	High Lift Discharge Flow Meter Replacements	Filtration, Disinfection, and High Lift Pumping	15		Approved	LH2024-009				\$400,000	
LH2058	Low Lift Check & Butterfly Valve Replacements	Raw Water Handling	3		Approved	LH2024-010				\$370,000	
LH2059	Raw Water Valve & Actuator Replacement	Raw Water Handling	15		Approved	LH2024-011				\$350,000	



Approval

- Budgets approved annually:
 - Operating budget (zero-base budget process) incorporates any related initiatives and impacts / outcomes of capital programs, contributions to reserve funds, etc.
 - Capital budget include projects based on prioritization, schedule, and interdependencies
- Financial model updated based on recommended / approved initiatives and programs
 - Assess impacts to reserve funds, debentures, debt capacity, etc.



Implement & Operationalize

- Document, document, document!
 - Operations & Maintenance Manuals
 - Permits & Licenses
 - OHS-PSRs
 - SOPs
 - Security & Emergency Response
 - Training, certification, permitting
- Assess risks due to construction/implementation (EMS / QMS / IMS / AMS)
- Assess risk changes post-operational assumption (EMS / QMS / IMS / AMS)
- Opportunities for Improvement



What's Next?

- “Employee-led” **Strategic Plan**, linked to LOS, risk mitigation framework, and four primary plans
- Improved feed-back assessment of implementation (continuous improvement)
- Continue to leverage **continuous improvement** and **process optimization** to gain system capacity, efficacy and efficiency



What's Next?

- (Re-)Balance affordability, sustainability, long-term growth, and generational equity
 - Continued iteration of the four primary plans (5-year cycle)
 - Integrate Health & Safety Management (ISO 45001 / CSA z-45001)
 - Integrate with Business Continuity Planning (CSA z-1600)
 - Integrate Risk Management processes (ISO 31000)
- ✓ Understand how each may impact operations, management systems and business process integration, and require further evolution.



Summary

- ✓ “*Capture once and use many*” (data/information)
- ✓ Integrate systemic approach within business processes for consistency and ease of implementation (organizational buy-in)
- ✓ Leverage data/information for better data-driven decision making (project/program management efficiency)
- ✓ Link activities to risk and performance improvement (operational efficiency)
- ✓ Clearly demonstrate value from outcomes (governance and accountability)

