QMS Infrastructure Maintenance, Rehabilitation & Renewal Review Form

A copy of this report is to be completed annually, and any time that maintenance programs change.

Date of Review	Wednesday June 26, 2023	
Review Cycle	August 2022-June 2023	
Drinking Water Systems Included	☒ Alexandria DWS	☒ Glen Robertson DWS

Review Participants Record

Name	Signature
Tim Wright	
Dean McDonald	
Angela Cullen	
Roch Seguin	
Eric Massia	
Chris Raymond	
Cameron Besner	

Conclusions and Recommendations *(attach any supporting documents and records)*

-Maintenance Programs are intact and operating as per deign,

- schedules and tracking forms are in good shape,
  - to determine who is in control or ensure staff understand document control and how to update version codes
- to ensure work is being completed as scheduled
  - staff changeover has been a recent concern, but as new operators gain experience should alleviate some time constraints
  - to ensure follow-up in internal equipment deficiencies for repair or replacement asap, to prevent further potential issues
  - external contractors dates are starting to drift from annual targets, to ensure booking is completed earlier or alternate source is used to ensure work is completed in timely fashion
- Documentation
  - duplication of recording work in eRIS and E11 to determine a better work flow so no duplication of work (Flushing)

-Areas of concern

- Alx DWS: pro-active equipment indexing and replacement program, elevated water loss / water audit, construction documentation, open equipment deficiencies and preventative maintenance vs reactive maintenance
- Gln DWS: coupling leak on main discharge piping, mineral deposits in well casing, and potential impacts on well pump, intermittent chlorine pump operation and dosing issues and intermittent high system flows

Discussion Item	Notes, Comments
a. Outcomes of previous maintenance reviews	-Systems operating as per design and maintenance appears to be scheduled and completed as per operational expectations. ▪ Programs in good shape, to ensure work is on-going among all staff. ▪ To ensure all equipment calibrated as per requirements (external contractors) -Discuss different budget ideas with operational staff ▪ Issues with generator annual maintenance (Dean Follow-Up) -Areas of concern ▪ Alx DWS: Intake sediment build-up, pro-active equipment replacement; older equipment and potential for breakdown; distribution degradation and operational requirements to maintain adequate levels; hydrant maintenance program to be recreated. ▪ Gln DWS: mineral deposits in well casing; intermittent dosing issues with P2; SCADA integrations; on-going well pump/pressure issues
b. Currency and accuracy of maintenance summaries in QMS Operational Plan	Alexandria ▪ All equipment incorporated into scheduling – No new or missing equipment identified – No new programs identified ▪ Areas of Concern: – noted issues with some versions of specific maintenance forms, to check current versions in maintenance binders to ensure currency. Let Angela know, if more forms are found so they can be updated to reflect current version. Original update used incorrect forms. – Roch assigned to upkeep the forms going forward Glen Robertson ▪ All equipment incorporated into scheduling – No new or missing equipment identified – NO new programs identified ▪ Areas of concern: – noted issues with some versions of specific maintenance forms, to check current versions in maintenance binders to ensure currency. Let Angela know, if more forms are found so they can be updated to reflect current version. Original update used incorrect forms. – Roch assigned to upkeep the forms going forward
c. Frequency and duration of service interruptions	Alexandria ▪ Alarms: 90 Location / Total / Aug 2022-Dec 2022 / Jan 2023-Jun 2023 WTP / 51 / 14 / 37 Dist / 39 / 24 / 15 reduced number of call out on average from previous review 13.5/mth to 9/mth ▪ Mill Pond fuels spill (Oct) – no affect to intake, precautionary shut down for 12 hrs ▪ 3 Extended Outage – BST: Jan-Hydro Issue (4.05hrs)

<table>
<tr><th>Discussion Item</th><th>Notes, Comments</th></tr>
<tr><td></td><td>
– WTP: Mar-Hydro Issue (0.65hrs)
– WTP/Bst/WTs: Apr-Freezing Rain (15.46hrs)
– Alarm Call Out Issues (on-going)
→ panel replaced (Aug)
→ panel communicator failure, replaced (Apr)
→ issues with delayed calls and non-reported alarms (central). Roch has reached out multiple times to try to correct issues.
▪ Access E11 cases: 144 (slightly increased from previous years, avg 91 cases per year)
– 88(Aug-Dec) 56(Jan-Jun)
– 18 Open Cases (3 Aug-Dec/15 Jan-Jun)
▪ Construction
– 2022: 20 sites recorded
→ 6 Watermain Break; 1 FH Replacement; 1 Valve Repair, 5 Service Line Repairs
→ 7 Planned (4 Tobin St, 1 Kincardine, 1 Bishop, 1 Derby)
– 2023: 1 site
→ Planned (service install)
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Glen Robertson
▪ Alarms: 80
<table>
<tr><th>Location</th><th>Total</th><th>Aug 2022-Dec 2022</th><th>Jan 2023-Jun 2023</th></tr>
<tr><td>WTP</td><td>70</td><td>36</td><td>34</td></tr>
<tr><td>Dist</td><td>10</td><td>4</td><td>6</td></tr>
<tr><td colspan="4">increased number of call out on average from previous review 3.75/mth to 8/mth</td></tr>
</table>
▪ 4 Extended Outages
– WTP: Dec (17:11-##)
– WTP/Chr: Jan-freezing rain (0.5hrs)
– WTP/Chr: Feb (11:04-##)
– WTP/Chr: Apr-freezing rain (15.5hrs)
– Alarm Call Out Issues (on-going)
→ issues with delayed calls and non-reported alarms (central). Roch has reached out multiple times to try to correct issues
▪ Access E11 cases: 11 (increased form previous years, avg 7 cases per year)
– 5(Aug-Dec) 6(Jan-Jun)
– 0 Open Cases
▪ Construction: 0
</td></tr>
<tr><td>d. Maintenance costs and trends</td><td>
Water Treatment & Distribution
▪ has base budgets have slightly increased each year since 2021
▪ significant overage in 2022
– significant overages noted in administrative cost, chemical costs, building maintenance and equipment maintenance,
▪ currently trending for all GLs are at 55% for forecasted values
Noted Trends
▪ Due to economy significant cost increases in many areas, but significant impacts to chemical costs and delivery
▪ Lead time on products are slow on certain
</td></tr>
</table>

Discussion Item	Notes, Comments
e. Occurrences of and trends relating to unplanned maintenance	Alexandria Outstanding Equipment Breakdowns ▪ F3 surface wash (Dec/Feb) – repaired Feb; issue reoccurred (Feb/Mar) – priced out new components as per recommendations, but only need mechanism to be repaired. – Roch assigned to following up on issue and to recommend repair or replacement option, as replacement cost was quoted over $10,000 (to add to T3 to ensure tracking) ▪ SCADA failure (Aug/Sep/Oct/Dec/Jan/Feb) – computer unresponsive; reboot to restart – faulty card; remove/reset to reboot → recommended to have spare unit (possibly 1 on-site, unknown location). → To find refurbished cards that were previously purchased to determine in above mention replacement card is required. Roch assigned to find cards. Were in grey cabinet before office was moved. (to add to T3 to ensure tracking) ▪ (CCP) Increased Turbidity – transition to warmer waters, unable to drop dosing; increased spiking after start-up (Aug/May) – Kemira on-site to test different coagulants/jar testing (Nov) – attempt to shut down polymer, to determine if chemical overdosing is causing issues (Jun) – to monitor and keep trying different dosing options to optimize treatment and reduce spiking. – Coagulant Tank isolation valve seized; to be repaired or replaced, unable to separate tanks currently. Operational staff to schedule work. (to add to T3 to ensure tracking) ▪ HLP1610 fault (Aug/Sep/Jan) – able to run manual but in auto, communication issues with SCADA – keypad replaced Aug; cables replaced Sep; T-COM board replaced (Dec) – replacement ordered, lead time not provided, but Capital Control confirmed no word yet on delivery (to add to T3 to ensure tracking) ▪ Basin 1 Effluent Valve V-941 (Aug) – not operational, threaded stem is stripped – ~~balloon in place (Aug)~~ action was not completed as found in eRIS, possibly confused with another repair. – lead time dependant on repair by Mike Lalond, once valve is removed and dropped off → Also mentioned that floc tank drain valve was also in need of repair. Delegated to Eric to set up schedule for repair (to add to T3 to ensure tracking) ▪ Monochlornmine Analyzer – unable to get parts in normal lead time – no longer operating properly after large repair, value in operation? – Determined to decommission analyzer, as repairs are not possible based on repair history with HACH/ClearTech ▪ Bst Stn Generator Oil Loss Issues – Operator monitoring and top up after run time (possibly burning oil) → Feb 1, Apr 8, Apr 9, Apr 13

Discussion Item	Notes, Comments
	– Dean in process of contacting JC Cayer for repair options (to add to T3 to ensure tracking) → Discussion about contracted maintenance, but due to cost plan was not purchased at time of commissioning ▪ BST SHP1 & SHP2 pump issues – air lock/primed unit and restarted transfer (Aug/Sep/Oct/Nov/Feb) – fitting/connection issues (Apr), repaired – issues do not seem to be occurring at the moment, to monitor operations. ▪ Filter Backwash Issues (Aug/Sep/Oct/Feb/Apr/May) – F4 valve torque limits reset (Sep) – issues with multiple filters valve failures during program steps → Cause of issues determined to be caused by faulty clearwell level monitor → Until equipment repair/replacement occurs, clearwell 4 (1602) now operating program to prevent future issues ▪ Clearwell 1 Level Transmitter (Jun) – Issues occurring 25-Jun-2023, contacted Capital Controls and able to determine that false low readings causing issues with filter backwashes and HLP operations – Levels fluctuations impact HLP operations, filter operations, CT calculations – Equipment only 3yrs old, to monitor operation, as unit must be in fault mode to diagnose cause of issue (controller vs probe). To have KMAC look into on-going issues, if needed can reach out to Greyline. (to add to T3 to ensure tracking) Completed Equipment Repairs ▪ Loss trending/communication – WTP/Bst/WT (Aug/Oct/Jan) → repair in Aug, eliminated the majority of previous issues → minor issues (weather related) – caused by internet transfer by IT Tech (2x Jan) ▪ Structural Repair in Filter Influent Channel – caused multiple issues prior to Aug, repaired (Aug) ▪ Generator failure due to low temperatures – caused by louvre failure; replaced (Feb) → motor connection; repaired (Mar) – issues with testing caused by program settings; resolved by KMAC (Feb) ▪ LLP210 (Jan) – pump fault, no cause determined ▪ (CCP) P610 failure, no switch over (Aug/Jan) – no alarm notification, caused by control box on panel – partial basin drain; to remove untreated water – noted F1 turbidity increase/AT1606 residual drop ▪ (CCP) Chlorine Gas Dosage (May) – noted drop in residual, found crack in dosing lines; replaced defective section ▪ BWP reinstallation – from previous breakdown, re-installed (Aug) ▪ V1410 motor replacement – multiple issues and unable to set torque limits (Oct)

Discussion Item	Notes, Comments
	– valve motor replaced Nov ▪ V697 Campbell Cres – rock jamming operation, repaired (Jan) ▪ H635 found frozen, repaired back in service within 24hrs ▪ Cl2 Gas Detector – Cl2 sensor failure, unit was calibrated 8 days later Noted Trends (one-time occurrence vs on-going issues) ▪ most issues are one time occurrence, or noted deficiency that takes time to repair due to time or part availability ▪ SCADA computer appears to need a reboot roughly once per month, unit was upgraded in 2022 – operator office computer slow to but lab computer good (difference between nodes) ▪ Gas Monitors appear to fail consistently about 1 month before servicing – Noted during discussion that alarm was disabled in SCADA, when enabled alarm is active but sensor not in alarm mode – Eric to reach out to Capital Controls look into signal/communication (to add to T3 to ensure tracking) ▪ Booster Stn SHP pump air lock appear to happen intermittently, no further action at this time ▪ Booster Station generator appear to be loosing oil during operation, Dean working on issues ▪ Duplication of recording work in eRIS and E11 to determine a better work flow so no duplication of work (Flushing). – To continue work flow as per discussion. Ensure all staff on same page
	Glen Robertson
	Outstanding Equipment Breakdowns ▪ (CCP) Sodium Hypo Pump Issues – SHP1 failure, possible air lock (Sep/Dec/Jan/Mar) – SHP1 flow sensor adjustment (May) – SHP2 cracked fitting causing air/leakage (Aug/Sep/Oct/Jan), repaired – SHP2 replaced due to on-going dosing issues (Nov) → Discuss possible repair or replacement options for SHP2. Communications with Prominent lead to pumps not sized properly, causing issues, but Prominent sized dosing system for installation. → To look into different type of pump, possibly peristaltic pump. (to add to T3 to ensure tracking) ▪ (CCP) Header Cl2 residual – cleaned/change injection point/prime SHP (Aug/Oct/Nov/Dec/Jan/Mar) – reset SurFeed/low flows (01:00-05:00) (Aug/Feb/Mar/May) ▪ Singer Valve Malfunction – temporarily by-pass (pre-Aug) → released pressure on singer valve, and dist pressure have not reoccurred to date → Removal of singer valve suggested by technician as it is no longer needed duet o pressure tanks.

Discussion Item	Notes, Comments
	→ Removal requires a full system shut down and isolation of WTP. Future Project (to add to T3 to ensure tracking) → Discussion noted that since UV#3 solenoid replacement, pressure on well side is noticeably more stable and bypass on well pump before UV (PRV) aways running since last well pump pump replacement. → To monitor system operation when UV# taken out of service to determine if solenoid replacement on UV1 & UV2 should be completed to help potential flow/pressure issues. Rough cost estimate per unit is $530/unit based on most recent invoice. ▪ Coupling Leak on Main Piping (Apr) – temporary sealant tape installed – Replacement requires full system shut down and WTP isolation and current replacement options will only lead to same issue, due to available coupling and pipe offset. – Roch looked into different options, as coupling is only current option, possibly using exterior lining to seal leak (to add to T3 to ensure tracking) ▪ Eric noted the spare well pump was dropped off by Adrien on 27-Jun-2023 (located in Shop, beside grey cabinet). Completed Equipment Repairs ▪ SCADA system placed on-line (Sep/Oct) ▪ Well Pump Pitless Adaptor O-Ring Replacement (Sep) ▪ UV3 solenoid failure (Feb/May) – causing decreased flows, possible Cl2 dosing issues (changed Jun) – unit back in service and no issues noted to date ▪ Filter Bank Leak (Aug/Sep) – UV3 5micron bank replaced (Sep) – UV1 & UV2 bank replaced (Sep) ▪ Hydro Meter exchange by Hydro One (Mar) – no impact, power out less than 5 mins ▪ High distribution Flows (May) – area canvas, letters distributed, Noted Trends (one-time occurrence vs on-going issues) ▪ On-going intermittent issues with chlorine residuals during low flow period – multiple issues with injection point blockage, pump operations, reduced flows due to UV operations – no smoking gun or clear indication of cause ▪ On-going issues with SHP2 operating issues – attempted multiple repairs, replacement pumps – pumps only work for short periods of time but cannot sustain continuous operation ▪ On-going operating issues with solenoid valve malfunction reducing flows – multiple equipment repairs, may be a partial cause to low residual issues – replacing unit to see if operation improves (Jun) was replaced ▪ Distribution pressure issues determined to be caused by singer valve malfunction

Discussion Item	Notes, Comments
	– unit by-passed, to remove from system as it is no longer required as per technical advisement
f. Adequacy of maintenance scheduling and recording systems	Operational Input ▪ internal schedule – Monthly Schedule (facilities) – Spring Flushing (Hydrant Only) → 2022: 32 days (17 Alx/3 TM/13 Max /1 Gln) → 2023: started a month later,38 days (21 Alx/3 TM/13 Max/1 Gln) • Confirmed that all system flushing was completed today. • Although flushing appears to have taken slightly longer, it was interrupted by training and time off. No concern about timelines • All defects were to be inputted into E11 for follow-up and tracking of issues – Distribution Valve Exercising → 671(Alx/Max/TM) + 3(Gln) valves in total → 2022: 56 days (42 Alx/14 Max; TM/Gln not completed) • 51 defects notes in program o 17 repaired/tested; 4 outstanding; 32 not input into Access o 26 other repairs completed o List was given to Roch with potential defects not reported in E11. Follow up to be completed as required • F-26 to be updated → 2023: all work to start after flushing completed. To ensure areas not operated last year are completed this year. – Fall Flushing → 18% hydrants in Alx only → 8 days (6 days north/5 days south) → need to include Maxville? – Hydrant Winterizing → 2022: 56 days (42 Alx/ 14 Max) → 4 rechecks; 1 not completed (H-165) – Hydrant Maintenance → target 50/year → starting with reported deficiencies → spot repair working towards preventative replacement program. • To come up with how operators are going to document repairs (electronic form/paper form). Need to know what information is required. (to add to T3 to ensure tracking)

Discussion Item	Notes, Comments

- Auto-Flushers
  - → Max 3 units installed, Alx not yet installed (after flushing program and school closures)
  - → ensure to input install and any flow adjustments in F38
- Bleeder Lines
  - → 2022 12 of 38 locations turned on
  - → 2023 0 of 38 locations
  - → to verify if bleeder lines are turned off (to assign responsibility to operator) (to add to T3 to ensure tracking)
- Water Audit
  - → new program 2023, due to high water loss
  - → currently on-going
- Operations Manuals
  - → Alx: revised Oct-2021; no major updates required to date
  - → Glen: revised Sep-2020; update required to include SCADA commissioning
- Asset Management
  - → TWP Plan approved by Council Jun-2022
  - → WW Plan 181-301A completed Aug 2020 (tied to QMS renewal cycle; 6yr coverage); next required 2025 before Sep-16
  - → need for system equipment identification and classification to help with future proactive replacement (plan?); to look at old list (to add to T3 to ensure tracking)

▪ external contracted

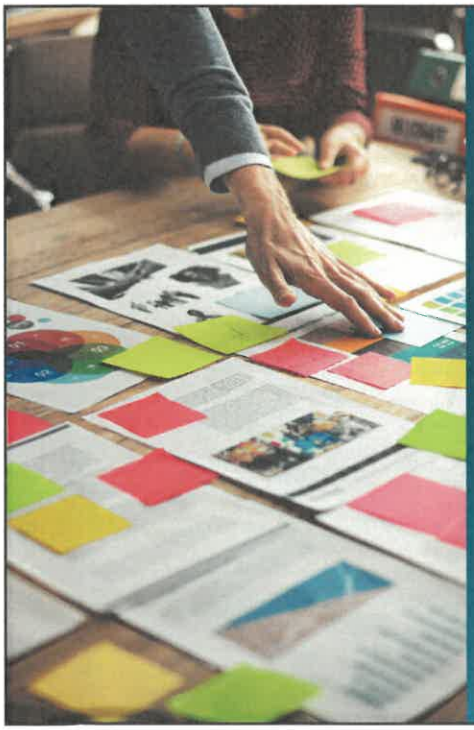
- Monthly Pest Control
- Bi-Annual Gas Monitor (Apr/Oct)
- Annual Backflow Device (Jul)
  - → Claude Bourk (WTP and Construction)
- Annual Analyzer/ Flowmeter Calibration (Aug/Nov/Dec)
  - → ClearTech (Hach and various Instruments)
  - → St Laurent (Prominent and Flow Meters)
- Annual Generator (Aug/Oct)
  - → JC Cayer (Generac Units)
  - → Micheal Blais (Other Units); change from GenRep
    - need emergency contact/contractor to change emergency listing and need emergency number Dean to provide information (to add to T3 to ensure tracking)
- Annual Pump Vibration Testing (Nov)
  - → Discussion determined to continue Hewitt but to only assess every 2yr cycle. To update Maintenance Summary (to add to T3 to ensure tracking)

Discussion Item	Notes, Comments
g. Compliance inspection reports	QMS ▪ Internal Audit: Sole Source Contractor: Ewen MacDonald – completed Oct 2022 – 0 non-conformances – 9 opportunities for improvement → 8 implemented /1 to be implemented / 0 no action ▪ External Audit: Sole Source Contractor: SAI Global – surveillance audit completed Oct 2022 – 1 major non-conformance → closed 6-Dec-2022 – reaccreditation audit completed Dec 2022 – 1 minor non-conformance → closed 31-Jan-2023 – 2 opportunities for improvement → 1 implemented / 1 to be implemented / 0 no action ▪ Best Management Tracking Form Reviewed some open items but most issues already discussed MECP ▪ Alexandria – Completed 19-Oct-2022 – 100% risk ranking – no identified compliance or best practices ▪ Glen Robertson: Sep 8 – Completed 19-Oct-2022 – 100% risk ranking – no identified compliance or best practices
h. Staffing and training issues as they pertain to maintenance goals	▪ Annual Requirement are being met by most operational staff, – staff to self-monitor/request training (on-line or in-class) – training to ensure renewal cycle every 3 years (42hrs CEU + 78hrs OTJ) ▪ Training Data Base Status – currently using compliance 365, Dean unhappy with performance/manual input – discussions about using Microsoft Form (created by Zoe) but has not been put into place, (minor form issues/time to complete) – Angela and Dean to discuss options going forward, Roch requested operator access. ▪ Outstanding Required Training – Standard of Care for Council and Director – OIT training (Roch to discuss what outstanding) – Lock Out Tag Out – Logbook ▪ Scheduled Training – hydrant maintenance (Jul 13)

Discussion Item	Notes, Comments
	▪ Suggested Training – live water main tap – maintenancefest (Kingston) – Prominent Training
i. Staff input	2024 Budget Ideas/Potential future Projects ▪ To post form in office area for operational staff to add ideas & suggestions for 2024 expense or capital budget – Line post inventory in Alexandria for all locations to have better records and locations going forward. Also help to improve mapping in system. – Vac trailer relining/coating inside drum. Concern due to internal abrasion from sediment. To see if repair is possible – Water pump on Vac Trailer, noted operational issues, may need replacing – Snowblower for Booster station, portable unit to help clean around walkways and generator area prior to delivery. With trailer so can be used at multiple sites – New electric submersible for construction, hydraulic pump is good, but required HydroVac trailer to be used. – Alx Wall mount chlorine analyzers (find out oldest and start changing older units) – Glen Prominent Distribution to make units similar and better for SCADA inputs – Magmeter for Hydrants, to look into possibly electronic unit for distribution flushing. – Calibrate meter annually (current hydrant) to ensure accuracy, as value used as input for water usage tracking
j. Other items (describe)	▪ Item removed as not water related, but to be added to potential budget request listing ~~→ Generator for leroux at VFD~~ ~~→ Sewage pump at sandfield~~ ▪ Twinrix vaccination for new operators – Cameron and Chris require for working with sewage – Issues in past due to change in EOHU policies – Dean to look into process
Other Notes	

2023 Alexandria DWS & Glen Robertson DWS

Infrastructure Maintenance, Rehabilitation & Renewal Review

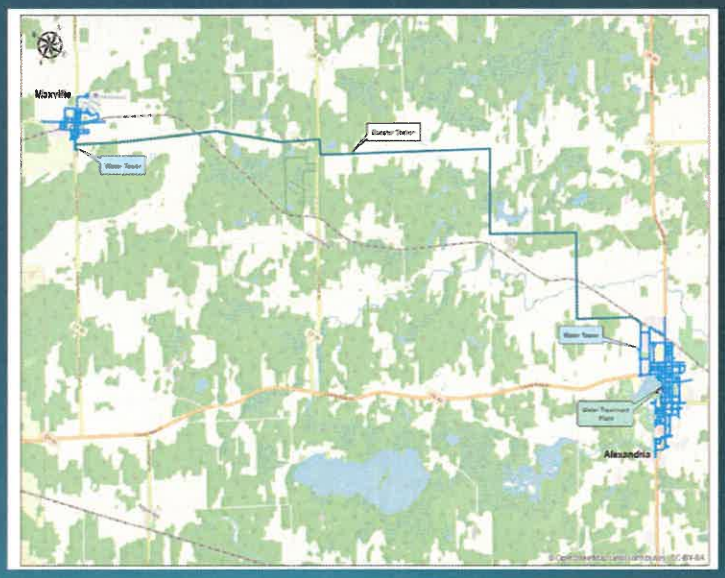


Agenda

- System Summary
  - Alexandria DWS
  - Glen Robertson DWS
- Previous Outcomes
- Maintenance Summaries
  - Internal Maintenance Summaries
  - External Contracted Maintenance
- Trends Related to Frequency and Duration of Service Interruptions
- Maintenance Cost and Trends
  - Water Treatment/Distribution Expense Budget Review
  - Full Operating Expense Budget Review
  - Capital Maintenance Programs
- Occurrence and Trends Related to Unplanned Maintenance
  - Internal Maintenance Programs
- Adequacies of Maintenance Programs
- Compliance and Conformance Inspections
  - QMS Multi System
  - MECP Annual Inspection
- Operator Training
- Staff Input / Other Items

Alexandria System Summary

- Alexandria DWS
  - Alx Water Treatment Plant
  - Alx Water Tower
  - Alx Distribution System
    - 28.1kms mixed piping
    - 1616 services connections
    - 145 fire hydrants
    - 454 valves
  - Max Booster Station
  - Alx-Max Transmission Main
    - 20.4kms 30mm piping
    - 17 fire hydrants
    - 12 valves
    - 32 air relief valves
  - Max Water Tower
  - Max Distribution System
    - 10.2kms of pvc piping
    - 320 services connections
    - 85 fire hydrants
    - 188 valves
    - 2 pressure relief valves



Glen Robertson System Summary

- Glen Robertson DWS
  - Gln Water Treatment Plant
  - No Distribution Water Storage
  - Gln Distribution System
    - 0.8kms of 150mm pvc piping
    - 48 services
    - 3 valves
    - 2 air relief valves
  - No Fire Protection
    - fire wells utilized for fire protection
    - no connection to municipal system

Previous Outcomes

- DWS Review Outcomes
  - Systems operating as per design and maintenance appears to be scheduled and completed as per operational expectations.
    - Programs in good shape, to ensure work is on-going among all staff.
    - To ensure all equipment calibrated as per requirements (external contractors)
  - Discuss different budget ideas with operational staff
    - Issues with generator annual maintenance (Dean Follow-Up Required)
- Areas of Concern
  - Alx DWS:
    - Intake sediment build-up
    - pro-active equipment replacement
    - older equipment and potential for breakdown
    - distribution degradation and operational requirements to maintain adequate levels
    - hydrant maintenance program to be recreated
  - Gln DWS:
    - Increased mineral deposits in well casing
    - intermittent dosing issues with P2
    - SCADA integrations
    - on-going well pump/pressure issues

Internal Maintenance Summaries

- QMS Summary
  - QMS SYS OP-Plan Appendix F1_T10A QMS Alexandria Maintenance Summery Table- Alexandria v3 (in QMS Operational Plan)
    - Review by foreman to ensure currency
  - QMS SYS OP-Plan Appendix F2_T10G QMS Glen Robertson Maintenance Summery Table v3 (in QMS Operational Plan)
    - Review by foreman to ensure currency
- Facility Maintenance Schedules
  - Alexandria Scheduled Maintenance, prepared and maintained by (who?)
    - M1 Alx WT Maintenance Schedule_v2
    - M7 Alx WTP Maintenance Schedule_v3
    - M63 Max BST Maintenance Schedule_v4
    - M73 Max WT Maintenance Schedule_v4
  - Glen Robertson Scheduled Maintenance, prepared and maintained by (who?)
    - M45 Gln WTP Maintenance Schedule_v4

External Contracted Maintenance

- External Contracted Maintenance
  - External Analyzer, Sensors and Transmitters Calibration Tracking
    - Updated External Calibrations Tracking Record Jun 19, 2023
    - Completed:
      - Meters, Sensors, Transmitters completed by St Laurent Instrumentation (recalibrating required Nov/Dec 2023)
      - Gas Monitors completed by Hetek (Apr 2023, recalibration required Oct 2023)
      - Maxville Tower Generac generators completed by JC Cayer(Apr)
    - Outstanding:
      - Hach Analyzers and Prominent Analyzers completed by ClearTech
        - Last completed Jun 2023 / scheduled July 17-19
        - outside of the annual completion dates by 1.5 months, due to contractor availability
      - Generators
        - Generac generators: Max Booster Station, Alx Water Tower, Glen Robertson
        - Generator: Alx WTP
      - Hoist & Lifting Devices completed by Corbit & Corbit
        - Last completed Apr 2022
        - currently outside the annual completion by 2 months, waiting for a date from contractor

Trends Related to Frequency and Duration of Service Interruptions

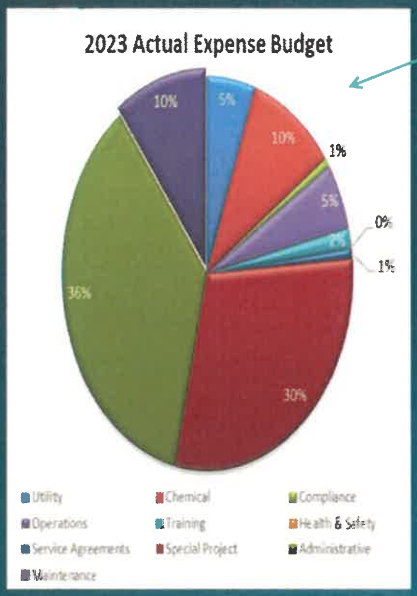
Alexandria

- Alarms
  - 90 Alarms (as per E-logs)
    - 3 Extended Power Outages
    - Mill Pond Minor Fuel Spill
  - Issues with delayed or no alarm notification
    - minor issues with on-site equipment repairs
    - Issues with alarm central protocols or operator capacities
- Access E11
  - 144 cases
  - 18 still open (print outs)
- Construction
  - 2022: 20 jobs completed
    - 7 planned
    - 13 emergency repairs/un-planned
  - 2023: 1 job completed
    - 1 planned

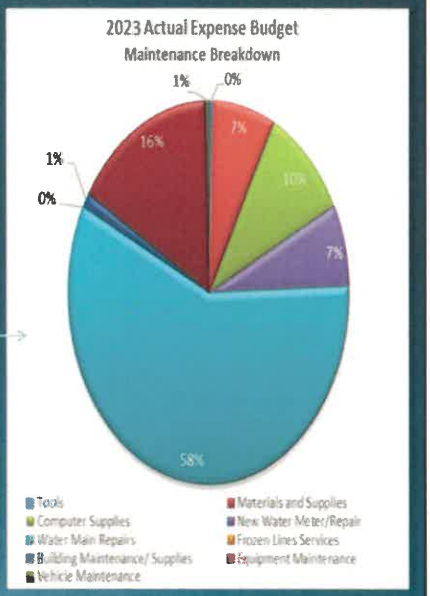
Glen Robertson

- Alarms
  - 80 Alarms (as per E-logs)
    - 4 Extended Power Outages
  - Issues with delayed or no alarm notification
    - minor issues with on-site equipment repairs
    - Issues with alarm central protocols or operator capacities
- Access E11
  - 11 cases
  - 0 open cases
- Construction
  - 0 sites

Water Treatment/Distribution Budget Review

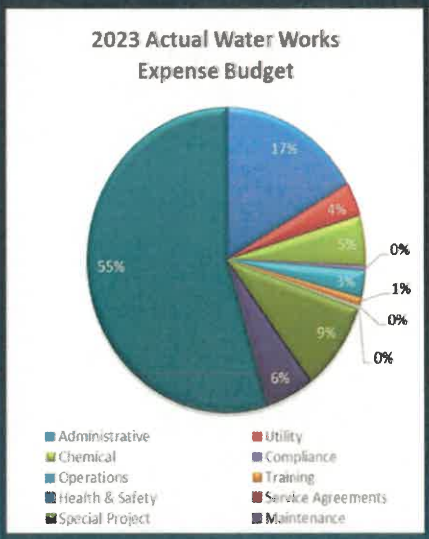


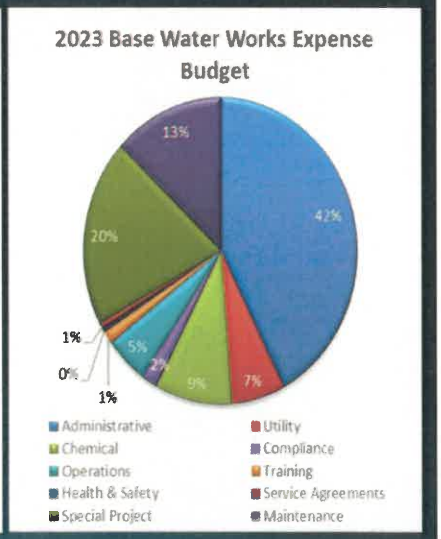
	Water		
	Base Budget	Actual Value	%
Utility	$ 82,300	$ 40,349	5.5
Chemical	$ 139,500	$ 71,486	9.7
Compliance	$ 26,400	$ 5,748	0.8
Operations	$ 67,700	$ 40,299	5.4
Training	$ 21,700	$ 11,652	1.6
Health & Safety	$ 5,650	$ -	0.0
Service Agreements	$ 15,000	$ 6,475	0.9
Special Project	$ 455,110	$ 220,062	29.8
Administrative	$ 677,872	$ 267,798	36.2
Maintenance	$ 199,900	$ 75,739	10.2
Tools		$ 310	0.4
Materials and Supplies		$ 5,531	7.3
Computer Supplies		$ 7,463	9.9
New Water Meter/Repair		$ 5,217	6.9
Water Main Repairs		$ 43,871	57.9
Frozen Lines Services		$	0.0
Building Maintenance/ Supplies		$ 945	1.2
Equipment Maintenance		$ 12,066	15.9
Vehicle Maintenance		$ 336	0.4
		$ 759,608	



Full Expense Budget
(9200-9300-9400)

	Actual Value	%	Base Budget	%
Administrative	$ 409,147	16.8%	$ 1,030,746	41.3%
Utility	$ 86,699	3.6%	$ 157,300	6.5%
Chemical	$ 129,177	5.3%	$ 221,500	9.1%
Compliance	$ 12,462	0.5%	$ 46,400	1.9%
Operations	$ 68,750	2.8%	$ 123,350	5.1%
Training	$ 21,731	0.9%	$ 32,200	1.3%
Health & Safety	$ 2,802	0.1%	$ 8,075	0.3%
Service Agreements	$ 5,711	0.2%	$ 18,500	0.8%
Special Project	$ 230,735	9.5%	$ 481,750	19.8%
Maintenance	$ 137,396	5.6%	$ 17,400	13.0%
Actual Total	$ 1,104,610		$ 2,437,221	
Remaining Actual	$ 1,332,611			





Capital Maintenance Programs

2022

- **Water Meter Replacement Program**
  - Not completed moved to 2023
- **Hydraulic Modeling**
  - EVB contracted to complete work, continued into 2023
- **Meter Stations (Flow Meters)**
  - Not completed, moved 2023
- **Wall Mounted Analyzer Replacement**
  - Not completed, units never purchased
- **Glen Robertson Well Casing Cleaning**
  - Moved to 2023 to combine with building expansion
- **Valve & Hydrant Replacement Program**
  - Completed (valves on Tobin in preparation for relining project)
- **Glen Robertson UV Replacement Program**
  - Completed February 2022
- **Electronic Logbook Transition**
  - Completed, operators/systems transitioned to eRIS April 2022
- **Tobin St Water Main Relining Program**
  - completed August 2022
- **Glen Robertson SCADA Installation**
  - Completed in October 2022
- **Lochiel St Water Main Relining**
  - Cancelled due to cost increase for project

2023

- **Alexandria Intake Upgrades (Dyke Installation)**
  - Drivers to be on-site within the next few weeks to complete work (July)
- **Alexandria WTP VFD Replacement**
  - Unit ordered, lead time or expected delivery (?)
- **Chlorine Gas Cylinder Switch Over Refurbishment**
  - Roch looking into equipment needs and pricing confirmation
- **Valve & Hydrant Replacement Program**
  - Dominion St (north of Lochiel St) in preparation for future projects
  - Park Ave/Lochiel St in preparation for 10" water main relining project
- **10" Feeder Water Main Relining (Jean St to Clement St)**
  - Currently completing flow testing to ensure system integrity prior to isolation
- **Residential Water Meter Replacement Program**
  - Maynard plumbing contracted for work
  - Glen Robertson started in June, Alexandria locations to follow
- **Glen Robertson Building Expansion**
  - Design and engineering possibly to be completed in 2023
  - To add well casing cleaning to project to scope of work
- **North Glengarry Master Plan**
  - EVB contracted to complete, status?
- **Meter Stations (Flow Meters)**
  - Funds being reallocated

Occurrences and Trends Related to Unplanned Maintenance

Alexandria

Outstanding Equipment Breakdowns

- F3 Surface Wash
- SCADA Hardware Failure
- (CCP) Increased Turbidity in Warmer Weather
- HLP1610 VFD Communication Issues/Replacement
- Alx WTP Basin 1 Drain Valve
- Filter Backwash Issues
- Booster Station Monochloramine Analyzer
- Booster Station Generator Oil Loss Issues
- (CCP) SHP1 & SHP2 Air Lock Issues

Completed Equipment Repairs

- SCADA Trending and Communication Issues
- Structural Issues in Filter Influent Channel
- Alx WTP Generator Louvres Motor
- LLP210 Fault
- (CCP) P610 Pump Failure with No Alarm Call Out
- (CCP) Chlorine Gas Injection Line Crack
- (CCP) AT1606 pH Probe Issues
- Cl2 Gas Room Monitor Sensor Failure
- Alx WTP BWP Refurbishment
- V1410 Motor Replacement
- V697 (Campbell Cres) Seized Valve
- H-635 frozen hydrant

Glen Robertson

Outstanding Equipment Breakdowns

- (CCP) Sodium Hypochlorite Pump Issues
- (CCP) Header Chlorine Residual
- Singer Valve Failure
- Coupling Leak on Main Discharge Piping

Completed Equipment Repairs

- SCADA installed and commissioned
- Well Pump Pitless Adaptor Replacement
- UV3 Solenoid Failure
- Filter Bank Replacements
- Hydro Meter Replacement (Hydro One)
- High Distribution Flows

Internal Maintenance Programs

Spring Flushing
• Alexandria / Maxville / Transmission
  • started 23-May-2023; still on-going
  • minor issues noted, captured in Access E11
  • no issues note in water quality
• Glen Robertson not yet completed
	Summer Auto-Flushers
	• Maxville 3 units installed 13-Apr-2023
	• Alexandria not yet installed

Distribution Valve Exercising
• Alexandria
  • 2022 completed (TM not completed or recorded); 2023 not started to date
  • 51 defective valve, 27 repaired
• Glen Robertson
  • not completed in 2022, to ensure it is completed 2023
	Bleeder Lines
	• Turned on as needed (extended cold snaps; or if frost is suspected below 5ft)
	  • Alexandria were not opened by operational staff in 2023
	  • To verify if lines were shut down from 2022 winter period

Fall Flushing • Alexandria completed in 8 days (Oct-2022) • No issues noted	Water Auditing • Due to noted increased water loss • Contracted to Kingsley Blease

Hydrant Winterizing
• Alexandria/Maxville completed in 56 days
  • Recheck required on 4 hydrants, 1 unit not rechecked (H-165)
	Operations Manuals
	• Alexandria OM- Oct 2021
	• Glen Robertson OM- Sep 2020
	  • To be updated to include SCADA system upgrades

Hydrant Maintenance (target 50 units/year)
• Alexandria
  • # hydrants issues from Spring Flushing
• Maxville
  • # hydrants issues from Spring Flushing
	Asset Management
	• Twp Plan approved by Council Jun 2022
	• Water Works Plan 181-301A completed by Treasurer Aug 2020
	• Need to categorize and rank internal equipment in order to determine future equipment refurbishment and to track equipment work life

Adequacy of Maintenance Programs

- Operator Input about Adequacy of Scheduling
- Areas of Concern
  - Alexandria
    - Higher risk of equipment breakdown due to age (Alx only)
    - Elevated Water Loss/Water Audit
    - Construction Documentation (all work sites including contracted work)
    - 10 open equipment deficiencies, to ensure follow-up/repair
    - Transition from reactive maintenance to proactive maintenance (eg Hydrants)
  - Glen Robertson
    - Coupling leak on main effluent pipe, requires system shut down to replace
    - Well Mineral Deposit Build-up, potential for impact on well pump
    - Sodium Hypo Intermittent Dosing Issues (pump and dosing system)
    - Intermittent high flows in Glen (possible usage by residents) and impact on treatment system

Compliance and Conformance Inspections

QMS Multi System

- Internal Audit: Sole Source Contractor: Ewen MacDonald
  - completed Oct 2022
  - 0 non-conformances
  - 9 opportunities for improvement
    - 8 implemented / 1 to be implemented / 0 no action

- External Audit: Sole Source Contractor: SAI Global
  - surveillance audit completed Oct 2022
    - 2 major non-conformance (closed)
  - reaccreditation audit completed Dec 2022
    - 1 minor non-conformance (closed)
    - 2 opportunities for improvement
      - 1 implemented / 1 to be implemented

Compliance and Conformance Inspections

Alexandria

- MECP Inspections
  - Rated at 100%
  - 19-Oct-2022
  - No non-compliance or bast practices identified

Glen Robertson

- MECP Inspections
  - Rated at 100%
  - 19-Oct-2022
  - No non-compliance or bast practices identified

Operator Training

- Meeting Annual Requirements to maintain licensing
  - Operators can request/are encouraged to request specific training topics
    - Training now available in-class or on-line
  - Training hour are to ensure license/certificate renewal 3 years
    - Hour requirements based on facility license level

	Class 1	Class 2	Class 3	Class 4	Limited	WOA
Director Approved CEUs	21	36	42	42	21	21
On-the-Job Hours	69	69	78	108	39	39
Total	90	105	120	150	60	60

  - Operators should be self-monitoring to ensure sufficient training is completed before renewal period
    - Compliance 365 vs internal data base (Zoe created MS Form)
- Upcoming/Required Training
- Suggested Training

Staff Input

- Budget Requests/Potential Projects

Conclusions

- Maintenance Programs
  - Schedules and Tracking forms
    - overall are in good shape
    - to determine who is in control or ensure staff understand document control and how to update version codes
  - Work Completion (as scheduled)
    - staff changeover has been a recent concern, but as new operators gain experience this should alleviate itself
    - to ensure follow-up in internal equipment deficiencies for repair or replacement asap, to prevent further potential issues
    - external contractors dates are starting to drift from annual targets, to ensure booking is completed earlier or alternate source is used to ensure work is completed in timely fashion
  - Documentation
    - duplication of recording work in eRIS and E11 to determine a better work flow so no duplication of work (Flushing)
    - streamline expectations

Areas of Concern

- Alexandria DWS
  - Pro-active equipment indexing and replacement program
  - Elevated water loss/water audit results
  - Construction documentation
  - Open equipment deficiencies
  - Maintenance Programs (reactive to preventative)
- Glen Robertson DWS
  - Coupling leak on main discharge pipe
  - Mineral deposits in well casing, and potential impacts on well pump
  - Intermittent on-going issues with sodium hypochlorite pump and dosing system
  - Intermittent high flows and impact on treatment system

Thank You For Your Time & Input