City of Winnipeg

North End Sewage Treatment Plant Upgrade Projects

Audit Report

KPMG LLP

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City of Winnipeg - North End Sewage Treatment Plant Upgrade Projects - Audit Report - Final

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KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

The information provided to us was determined to be sound to support the analysis. Notwithstanding that determination, it is possible that the findings contained could change based on new or more complete information. KPMG reserves the right (but will be under no obligation) to review all calculations or analysis included or referred to and, if we consider necessary, to review our conclusions in light of any information existing at the document date which becomes known to us after that date.

The Client is responsible for its decisions to implement any opportunities/options and for considering their impact. Implementation will require the Client to plan and test any changes to ensure that the Client will realize satisfactory results.

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1 Executive Summary

1.1 Background and Objective

The City of Winnipeg ("the City") is currently undertaking a large and complex wastewater upgrade program at the North End Sewage Treatment Plant, otherwise known as the North End Water Pollution Control Centre ("NEWPCC) Projects (the "Projects"). The Projects are being undertaken to comply with Environment Act Licence requirements and timelines, address capacity limitations, and age of the existing infrastructure. The NEWPCC Projects consist of three projects, each with a respective budget and phase of completion.

The budget numbers shown in the table are as provided by the City and reflect the information available at the time of this audit:

NEWPCC Project	Phase	Budget (2019) [1]	Budget Amendments	Budget (2024)	Scheduled Completion
Power Supply and Headworks Facilities ("Headworks")	Construction	$408M	$65M (2021)[2] $45M (2024)[3]	$518M	2026[4]
Biosolids Facilities	Development Phase	$553M	$482 (2023)[5]	$1.035B	2030
Nutrient Removal Facilities	Pre-Procurement	$828M		$828M[6]	2030[7]
Total		**$1.79B**	**$592M**	**$2.38B**	

The City's Audit Department engaged KPMG to complete an audit of the Projects (the "Audit") with the objective to evaluate the existence, effectiveness, and adequacy of controls related to project governance and oversight, project leadership and organization, commercial strategy and management, and project delivery and risk management. Acknowledging that the Projects are currently facing challenges affecting the work and potentially increasing the risk and exposure profile of the Projects, the Audit includes an evaluation of the nature and extent of factors contributing to these challenges. The Audit identifies opportunities for improvement in the delivery and achievement of the Projects' cost, schedule, and scope objectives. The Audit excludes project financials and financial reporting.

[1] Class 3 cost estimate (including interest charges) in 2018 dollars presented to and approved by Council on February 28, 2019.
[2] $65 M budget amendment for Headworks Project due to Preferred Proponent's price exceeding the affordability threshold. Approved by Council on May 27, 2021.
[3] $45 M budget amendment for the Headworks Project due to costs associated with the Northwest Interceptor failure. Approved by Council February 22, 2024.
[4] Headworks Project is scheduled for completion in 2026, however, the Distributed Control Migration ancillary project will extend to Q4 2027.
[5] $482 M budget amendment for the Biosolids Facilities due to an updated Class 3 cost estimate based on rapidly changing market conditions. Approved by Council on September 29, 2023.
[6] Nutrient Removal cost estimate currently under review.
[7] Nutrient Removal scheduled completion date is based on the regulated completion date and is currently under review.

The Audit was conducted using KPMG's "Five Pillars of Major Project Success" framework and includes an evaluation of the three projects to identify opportunities for improvement in project delivery, with a focus on the following areas:

- **Governance & Oversight**: including strategic alignment, decisions and escalation, stage gate (i.e., a decision point during the project lifecycle per the City Project Management Manual) process, key performance indicators, reporting and line of sight, and means to assure compliance.
- **Organization & Performance**: including organization and integration, leadership and behaviors, capacity and capability, and internal stakeholder management.
- **Commercial & Financial**: including contract strategy, procurement execution, and relationship management.
- **Delivery & Risk Management**: including cost, schedule and controls, risk management, contract and claims management, and processes and systems.

The Audit scope excluded evaluation of the Approvals and Social License Pillar.

The time period of this project audit covered May 29, 2024 to August 30, 2024. Excluded from the scope of this engagement were evaluation of the Strategic Partner Program with Veolia; Health, Safety, Security and Environmental ("HSSE") protocols and performance; contractor systems and controls; construction means and methods; capital estimate review; operational interfaces; procurement fairness review; contract risk and risk allocation review; contingency development and drawdown review; contract terms and conditions review; technical specifications review; funding agreements review, operational reporting review, and tests of operating effectiveness (i.e., sampling (e.g. controls related to document management structure and records), detailed vouching (e.g. controls related to project controls calculations), etc.).

1.2 Context

The Projects are a schedule driven $2.38 billion program of works (this includes a 2018 cost estimate for Nutrient Removal which is currently being updated to reflect 2024 costs). It is comprised of three projects each a major project and with a size and complexity not commonly undertaken by the City of Winnipeg.

Major projects have a high monetary value, typically costing $500 million or more, schedule urgency, and a transformational effect. Major projects have a disproportionate exposure to complexity and uncertainty, and distinctly different structures, stakeholder dynamics, and impact relative to routine projects. They are not business as usual or simply smaller projects scaled up. Major projects are vulnerable to failure and require unique decision-making and oversight models, processes, and systems, and require resources with requisite experience and capability.

The Projects consist of three complex major projects that are distinctly different in scale and form from those typically delivered by the City of Winnipeg. The table below highlights the Projects complexity across ten dimensions. In each dimension NEWPCC project complexity is rated as High. The size and complexity of these projects highlights the criticality of having effective and adequate measures and controls in place in order to manage risk to the City and to project objectives.

Projects Complexity Assessment	
Cost	High
Duration	High
Scope / Technical	High
Commercial	High
Uniqueness / Organizational Familiarity	High
Organization Capacity / Team Requirements	High
Interfaces / Dependencies	High
Stakeholders and Rightsholder	High
Political Scrutiny	High
Uncertainty	High

The Projects have experienced recent cost and schedule pressures including notable challenges experienced on Headworks, including Northwest Interceptor ("NWI") failure, unanticipated and differing ground conditions, and a period of high project team turnover. The Projects have also experienced cost increases from the original budget in 2018 due to project delay, project financing, regulatory/scope increases, and like many projects undertaken over the past five years, market escalation.

1.3 Summary of Findings

Although our assessment is critical in nature and focused on opportunities to bring the Projects in line with industry practice, we have also recognized key strengths within the Projects environment. These include:

- **Contract strategies and procurement options**: Detailed project-specific contract strategies and procurement options analysis have been completed or are planned to be undertaken for the Projects in line with expectations and leading industry practice resulting in contracts that align with City risk tolerance and market interest.
- **Dedicated Project team**: The Projects Team is comprised of dedicated members who are committed to the success of the Projects. This includes the collaboration and integration with Veolia North America ("Veolia") who can supplement the City of Winnipeg personnel on an as needed basis and bring relevant major project experience.
- **Team communication and commitment**: Strong team communication has been built within the Projects where open communication between all members and a philosophy of engaging and escalating issues (i.e., current problems) or items quickly has been established. The team has demonstrated commitment through resolving outstanding claims and dealing with challenges including rebuilding the team. This approach can minimize the magnitude of issues.
- **Audit**: Projects were included in Audit Department Audit Plan due to risk to the City. This is in line with expectations, and it is recommended that the Projects continue to be included in future audit plans as part of ongoing assurance.

- **Following City procedures and policies**: The Projects Team is following the City's established policies and procedures. However, these are not all fit-for-purpose (i.e., meets the specific needs) for the size and complexity as further explained throughout this report.
- **Following reporting requirements**: City reporting requirements are being adhered to and the Project is reporting to multiple levels of the City, along with the regulator and other stakeholders. The reporting is not aligned to industry practice for major projects.

The results of our review indicate that the Projects are following the current structure, guidelines, and processes in place as part of the City's established procedures and policies for capital project planning, initiating, executing, and close-out. However, these structures, guidelines, and processes are designed for smaller, lower-risk projects and are not fit-for-purpose for the cost, complexity, and consequences associated with the Projects. Major projects in the City's guidance documents, including the Project Management Manual ("PMM"), are defined as those over $20-$30 million while the budget for the Projects is over $2 billion.

The summary of observations and detailed findings included in this report provide the details to support our conclusions.

Many of the cost pressures, including the NWI failure, differing ground conditions on Headworks, and the overall market inflation over the last five years, are elements outside of the Project's control and are not direct results of inadequate systems or controls on the Project. The gaps identified throughout this report result in risk for further cost and schedule growth.

Our key observations and recommendations for consideration are summarized by review area. Further information related to the observations and recommendations can be found in Section 4 - Detailed Findings with Consequences and Recommendations.

Governance & Oversight

Key Observations

- The governance and oversight controls, as governed by City policy FM-002, FM-004, and the City's PMM, including the oversight model, stage gate structure, reporting and assurance requirements, are not adequate for the size, complexity, and consequence of the Projects.
- The Projects governance consists of the Major Capital Project Advisory Committee ("MCPAC") which is established by the Water and Waste Director per the requirements of FM-004, Administrative Standard for Asset Management. The MCPAC membership requirements are defined in FM-004, and the committee reviews the projects quarterly (minimum). The governance and reporting structure flows up from the MCPAC to the Standing Policy Committee on Finance and Economic Development which reports to the Executive Policy Committee which then reports to Council. This structure is designed for smaller, lower risk projects and is not fit-for-purpose. Given the high cost and consequence of the Projects the MCPAC is too far removed from City Council in the reporting structure and the reporting timeframes take too long to report and receive feedback from Council. The current governance structure does not adequately support achieving appropriate alignment, accountability, autonomy, and disclosure to effectively oversee and monitor NEWPCC performance and risk.
- The Stage Gate structure used on the Projects is a City standard structure designed for smaller Design Bid Build ("DBB") projects. It does not accommodate the commercial models on the Projects, nor the scrutiny required for approval decisions on the Projects. Stage gate requirements and major decision points are not well defined for the NEWPCC commercial models.

- The Project Sponsor role was assigned to the Water and Waste Engineering Manager by the Department Director, per the requirements of FM-004. Typical industry approach is to assign a senior executive as Project Sponsor for a project of this size and complexity.
- There is a misalignment between the authority and accountability on the Projects with accountability at the Project Director / Project Manager level and authority at the Department Director, governance, and City Council levels. Authority refers to financial authority along with decision making and staffing authority. A modification of financial authority was made for the project in 2010 with subsequent adjustments to the CAO level of authority in specific instances in 2018, 2022, and 2023. The adjustments resulted in selective increases to the financial authority on the project team.
- Disclosure to the governance bodies (i.e., MCPAC, Council committees, and council) is occurring in various reports in the specified templates. The current reporting does not provide a transparent picture of the Projects status and performance due to template restrictions that miss key information. There is no dashboard reporting that succinctly captures performance against planned objectives. An easy to use, overall report summarizing performance and including Key Performance Indicators ("KPIs") across specific categories and geared towards overall project governance is lacking. As an example, reports include percentage of schedule and cost but do not include a progress measure to give context. Although the Projects follow the current FM-004 standard which is to report financial data quarterly, for a project of this size and complexity, the financial reporting to the project governance is infrequent compared to industry standard.
- There are no documented defined issues escalation protocols on the project. Currently, the Projects escalation, while working, relies on the project team knowledge of what and where to escalate.
- Although the Project follows the PMM template to define its objectives, leading practice for projects of this size and complexity is to have additional objectives related to safety and reputation. The PMM specifies project objectives to be cost, scope, schedule, and quality.
- There is no defined project assurance or independent monitoring plan to assure outcomes on the Projects. Outside of the Audit Department Audit Plan there is no independent monitoring of project performance or health. Project assurance provides confidence to senior leaders and stakeholders that work is controlled and supports successful delivery of project objectives.
- The City processes related to major projects focus on projects in the $20-$30 million magnitude with traditional Design Bid Build delivery models. They contain little guidance for planning and delivering highly complex, high consequence major projects of hundreds of millions to billions of dollars.

Key Recommendations

1 **Governance Model** - Implement a fit-for-purpose governance model that streamlines oversight and supports effective alignment, accountability, autonomy, and disclosure on the Projects. The governance and oversight committee should be elevated within the City structure (e.g., elevated Project Sponsor, Chair, and single Council sub-Committee), be chaired by the Chief Administrative Officer ("CAO") and report directly to Council. The governance review of project performance including cost performance relative to budget should occur monthly.

2 **Stage Gates** – Develop a project lifecycle for the Projects that considers the Design-Build ("DB") and Progressive Design Build ("PDB") delivery. Plan the stage gate requirements including the documents and readiness criteria. Document in the project plan complete with required approvals.

3 **Project Sponsorship** – Consider assigning a Sponsor role to a senior executive who has the authority to align the project goals within the City organization. Examples of Project Sponsors from industry for projects of this size include Chief Operating Officer, Chief Financial Officer, Executive Vice Presidents, Vice Presidents, or other members of the executive team.

4 **Delegation of Authority** - Revise the decision and financial delegation of authority in alignment with project specific governance structure, including more delegated authority to empower the Project team to make timely decisions such as those related to contract changes. It is typical industry practice to

have authority delegated to the Project, within financial limits, for management of items within the initial approved budget / contract. The levels within the delegation of authority should be developed specific to the needs of the Project and through consultation with executive leadership and Council. They should consider the existing delegation of authority, project contracts and commercial structures, stage gate structure, governance structure, contingency drawdown curve, and City requirements/precedent.

5 **Reporting and KPIs** - Develop a project report with an easy-to-use dashboard to provide a single report of project performance against objectives. The report should include project performance and KPIs across safety, environment, cost, schedule, progress, quality, etc. along with key risks and issues. Commentary to address performance, risks, issues, and an explanation as to why a KPI is off plan, what actions are being taken to address the issue, and the expected outcomes should also be included.

6 **Issues Escalation Protocols** - Develop escalation protocols and specify guidance in the project documentation.

7 **Review Project Objectives** - Assess the NEWPCC project objectives and add objectives as needed to address gaps such as safety and reputation.

8 **Project Assurance** - Implement additional means to assure performance and compliance to policy and objectives such as ongoing project assurance reporting directly to the revised governance organization and continued audits focusing on key areas including risk and reporting. Develop an ongoing Project assurance function independent from the Project team as an extension of the Project's governance and oversight structure. The assurance function should analyze the Project's performance against key metrics and risks and have a direct reporting relationship to the Project governance committee.

9 **Major Project Guidance** - Update the major project guidance to identify considerations related to highly complex, high consequence projects. Should be completed prior to the next major project phase (e.g., Biosolids construction phase).

Organization & Performance

Key Observations

- NEWPCC has adopted the standard City approach to project organization where possible. This approach anticipates a DBB delivery model for routine capital projects and is not providing the required capacity or capability to effectively manage the Projects. NEWPCC therefore has had to deviate where required, including the partnership with Veolia and some adjustments to job classification for the current team.
- The City Project team is comprised of eight full-time personnel at the time of this review, including a Project Director, two Senior Project Engineers, one Project Manager, and four support roles (i.e., project engineer, project coordinator, project officer) plus a part-time finance support role for reporting. The City team is bolstered through the use of the Veolia partnership, including for Project Controls and procurement support. The Projects owner team is small relative to industry practice. Due to the relatively small Project Owner team, there are challenges in managing the workload for a project of this size and complexity, including resources to support negotiating and managing funding agreements, risk management, contract management, rightsholder participation management and social procurement, public communication, and operational representation. The Projects recently received approval for four more Senior Major Capital Project Engineers and are in progress fulfilling these roles. The City staff assigned to the Project have experience in project execution but have limited major project experience as very few projects of this size and complexity have been undertaken by City staff. To mitigate this gap in major project experience, the City has paired their senior project engineers with advisors from their strategic partner Veolia, to supplement their existing knowledge.
- The current Project Director assumed the role in October 2023 and has focused on rebuilding the team after a period of high turnover. The staffing plan includes three new hires in the short term, with longer range staff planning in progress. The scope of the Project Director is to oversee the Winnipeg Sewage Treatment Program which includes projects at the North, South and West End facilities while typical industry practice is that a project director or equivalent for a major capital project is not also overseeing

capital projects at other facilities. Project reporting currently occupies a large percentage of Project Manager time, and more staff are required to support the amount of reporting required for a project of this size and complexity.

- The Projects report into the Water and Waste Department, with the Project Sponsor as the Manager of Engineering for Water and Waste. The Manager of Engineering / Project Sponsor reports to the Director of Water and Waste who is responsible to Council for the delivery of the projects. Integration with other City departments is through normal channels supported by existing relationships and MCPAC members. Project organization charts and responsibility matrices are out of date and do not adequately identify reporting lines.
- The Projects objectives are clearly defined for the included categories (refer to Governance & Oversight above for detailed observations and recommendations for additional objectives) and communicated across the City Administration. However, the interactions and effects of the alternative delivery methods used for the Projects on other City processes and procedures (e.g., coordinating permitting with preliminary or developing design information instead of final design per the usual process) was not adequately considered in project planning which can lead to issues and impacts on cost and schedule.

Key Recommendations

10 **Bolster Team Size / Capacity** - Review the team size, capacity, and capability to reduce the load on individual team members, risk to the City, and impact of change of personnel. Develop succession planning and review of levels and compensation for key roles to maintain an adequately competitive position. Augment the team by adding more major project experience to support critical areas including reducing the scope of the Project Director role or adding support to that role.

11 **Organization Charts and RACI** – Update organization and Responsible, Accountable, Consulted, and Informed ("RACI") charts. Revisions should include defining authority and reporting within the Projects and balancing responsibility across the team. Refer also to Governance & Oversight for authority / accountability recommendations.

12 **Internal Stakeholder / Organization Change Management** - Develop an organizational change management strategy and internal stakeholder communication planning to support understanding of the Projects and the delivery model and getting stakeholders onboard with the project requirements and decisions. Refer also to Delivery & Risk Management below.

Commercial & Financial

Key Observations

- The City has developed project-specific contract strategies and completed detailed procurement options analysis for the Projects in line with expectations and industry practice. For the Biosolids Project, this work has resulted in the decision to proceed with a PDB delivery model. This form of delivery model was selected based on what the market is currently willing to accept. It is new to the City of Winnipeg and, therefore, there is limited precedent for executing a project under this model. The differences between the PDB model and a DB or DBB model are not accounted for in the project processes including for example, effective risk management and commercial oversight to manage the PDB conversion risk, resourcing, and process requirements to facilitate open, collaborative, and timely design review and development, and differences in design completion at stage gates.
- A contract risk allocation exercise was completed for the Headworks Project, however, there is evidence that some of the transferred risks could have been more actively managed to ensure contractual risks transferred to the design build contractor were not inadvertently assumed by the City. A contract risk allocation exercise was also completed to support the Biosolids pre-procurement activities. A similar contract risk allocation exercise has not yet occurred for Biosolids execution phase and Nutrient Removal as contracts have not yet been awarded for those projects.

- While overall contract strategies have been developed, strategies or plans for managing key contract interfaces are not clearly defined including for interfaces between contracts or scopes within a project and for between the three main projects (i.e., Headworks, Biosolids and Nutrient Removal).
- A formalized project specific relationship management strategy or plan does not exist to outline the strategies and tactics for managing the contractor relationship so that issues can be resolved prior to the use of the formal, contractual dispute resolution processes included in the project contracts. Informally, it is understood that the strategy for managing the relationship with the contractor is through consistent and open communication, including regular coordination meetings at the project and executive level and that there are no current concerns with the relationship with the main contractor on the Headworks project.

Key Recommendations

13 **Progressive Design Build Contract Awareness** - Hold awareness or education session(s) with all Biosolids Project stakeholders in the City organization regarding a PDB delivery model and differences when compared to previously used delivery models such as DB or DBB. These sessions should extend beyond the Water and Waste Department and include other departments affected by changes in workflow or processes, such as permitting. The content for the session should include key highlights from the contract (e.g., commercial model, risk allocation, schedule milestones, PDB conversion overview, etc.) along with specific elements relevant to the various City stakeholder groups (e.g., design review process, design completion percentage at stage gates, permitting requirements, etc.). It should also specifically highlight where risks, resourcing/involvement, and process differ from traditional delivery models typically used by the City.

14 **Contract Risk Allocation** – Increase frequency in monitoring contractual risks as part of the Project's risk management plan. Refer to observations and recommendations in the Delivery & Risk Management section below. Complete a contract risk allocation exercise for the execution phase of the Biosolids Project and Nutrient Removal, as planned, when the project progresses into procurement and contracting. The risk allocation exercise should clearly define contract risks as retained, transferred, or shared with the main contractor.

15 **Interface Management** - Develop contract interface management plan(s) for the main contract interfaces. This can be included as part of other Project documents, e.g., the Project Execution Plan, Contract Strategies, or Contract Management Plan.

16 **Relationship Management** - Document the plan for relationship management with the major project contractor(s). This can be included as part of the contract management plan or other Project documentation. Refer to recommendations in Delivery & Risk Management below.

Delivery & Risk Management

Key Observations

- The City is relying upon its PMM for guidance on required activities and procedures for elements of the Delivery & Risk Management Pillar including risk management, cost, and schedule management, change management, and claims management and avoidance. While this guidance covers many of the key features of these areas, it does not adequately support the nature, size, and complexity of the Projects, nor does it address the project-specific and delivery model nuances in process and responsibilities.
- Risk management is not occurring at a level required for the complexity and risk profile of the Projects. Processes do not meet industry practice for effective risk management.
- Cost and schedule management is occurring at an overall project level but does not appear to include adequate tracking of performance at the work breakdown structure ("WBS") level. Limited data on project cost and schedule performance is being used in City project reporting to provide insights and support effective oversight. The Project team is using the City required reporting templates and tools,

however, these are not adequate for a project of this size and complexity. Key metrics being reported include Cost Performance Index ("CPI") and Schedule Performance Index ("SPI"). However, for the Headworks Project, the CPI is not an effective metric to demonstrate cost performance due to the milestone payment structure of the DB agreement. While a project control dashboard exists to report on metrics such as SPI and CPI, it is missing key information such as physical progress relative to plan, risks, and issues.

- The change control process for Headworks appears to be aligned to guidance in the PMM. However, with limitations in delegated authority, change orders are delayed in approval beyond the timeframe that is stipulated in the DB agreement. This could lead to project delay and presents the risk of future claims from the contractor.
- A complete project specific contract management / administration plan does not exist and the Responsibilities Matrix, which includes details on responsibilities for aspects of contract administration on the project, requires updates and enhancements. The project team has developed a process and procedures document to clarify certain processes in the DB agreement. While the process and procedures document identifies many of the key elements of effective contract management, it does not reflect the complete view of contract administration including all project-specific processes and the delineation of responsibilities.
- A project specific claims management plan and claims avoidance strategy does not exist. While the PMM identifies many elements of effective claims avoidance and management, it does not reflect the specifics of this project and does not clearly identify the roles and responsibilities for claims management including for overall claims administration and claims analysis.

Key Recommendations

17 **Risk Management Plan** – In addition to the risk registers the Projects currently use to monitor risk, develop a risk management plan that reflects the size and complexity of the projects. The risk management plan should include key elements such as clear risk evaluation criteria, defined processes for risk escalation and management, clear role delineation, quantitative risk assessment ("QRA") requirements, and reporting of top risks.

18 **Active Risk Management** - Increase frequency of active risk management for the Projects. Risk registers should be maintained with up-to-date mitigation plans including status. New risks should be added as they occur, and obsolete risks should be removed. A risk breakdown structure can help with focusing on relevant risks for the project stage. Industry practice for projects of similar size and complexity is to review and update risks at least monthly with more frequent reviews required for initial development and periods of high activity (reduced frequency may be appropriate during periods of low activity), refer to AACE 62R-11 Risk Assessment Identification and Qualitative Analysis for additional guidance.

19 **Earned Value Management** - Expand the scope of the earned value management ("EVM") system to include all material components of the project budget, not just the Headworks DB. Consider including additional performance metrics to inform cost and schedule performance.

20 **Project Cost and Schedule Reporting** - Enhance project cost and schedule reporting to include additional cost and schedule performance metrics, detailed tracking system at the WBS level, which could involve developing productivity and quantity curves to better forecast cost and schedule. Refer to Governance & Oversight above for further detail regarding reporting.

21 **Timely Change Control** - Expedite the change order review and approval timelines. The primary means to achieve this is through changes in the delegation of authority and/or escalation as required through escalation protocols. Refer to recommendations above in Governance & Oversight regarding delegation of authority for the project and escalation protocols. In addition, implement an expedited approval pathway for urgent changes where fast approval is required to control risk to the City. This would not include typical situations that would be covered by the delegation of authority and should be reserved for high dollar value high risk changes. Criteria for use of the expedited approval pathway should be developed.

22	**Update Project Plans** - Develop and document project specific processes, procedures, roles, and responsibilities in the management plans and strategies, including contract management and administration, claims management and avoidance, internal stakeholder / organization change management, and others as required.

While our review did not include evaluation of the elements related to the Approvals and Social License pillar, the following observations and recommendations are included for consideration.

Approvals & Social License

Key Observations

- The size and purpose of the Projects results in a level of press interest and public scrutiny that requires a comprehensive strategy, management plan, and dedicated resources. The current plan for public communication is out of date for the Project.
- City Council has given specific directives to the Biosolids project that are outside of the corporate strategy for social procurement. Social procurement and communication with Indigenous communities have long term implications for the City of Winnipeg. Currently, these activities are being done specific to the Projects without connection to a City of Winnipeg overall strategy. A City-wide approach to communication with Indigenous communities is not currently in place.

Key Recommendations

23	**Projects Public Communication** – Develop a strategy and plan for managing the public profile of the Projects and allocate resources to support coordination and alignment with City-wide activities. Consider reassessing the public communication approach and engaging specialist resources, reporting to the Project Director, to support in messaging and media.
24	**Communication with Indigenous Communities**– Develop a comprehensive City-wide approach to communication with Indigenous communities including for major projects such as the NEWPCC Projects. Dedicate resources, reporting to the Project Director, to support the implementation on the NEWPCC Projects.
25	**Social Procurement** – Continue as planned to develop the social procurement plan and incorporate into the project planning documentation.

Our review identified a total of 25 summary observations / recommendations comprised of 44 detailed observations / recommendations. Our detailed observations and recommendations are in Section 4 Detailed Findings with Consequences and Recommendations. Our observations have been classified based on the perceived risk of financial and / or operational impact on the City if not resolved. Further explanations of the ratings and classifications used are included in Appendix B.

City Management has agreed with the recommendations and their response to the recommendations including timing have also been included in Section 4.

2 Project Context, Assessment Criteria, and Key Risks

This section describes the background and status of the Projects, provides context related to certain project challenges, and identifies the assessment criteria used to perform the review.

2.1 Project Background and Context

The NEWPCC, or North End Sewage Treatment Plant, is the oldest and largest wastewater treatment plant in the City of Winnipeg, providing 70 percent of the City's liquid wastewater and 100 percent of the City's wastewater solids treatment. It is being upgraded to comply with Environment Act Licence requirements and timelines, address capacity limitations, age of existing infrastructure and includes improved treatment plant technology to protect Winnipeg's waterways and meet the needs of the growing population.

The Projects are part of the larger Winnipeg Sewage Treatment Program ("WSTP") and are divided into three main sub-projects: Power Supply and Headworks Facilities ("Headworks"), Biosolids Facilities, and Nutrient Removal Facilities. The Projects have been in planning since 2009 (when new licence limits were imposed) and were split into three separate projects in 2019. The projects have been phased with each one at a different stage of completion. A brief description and context for each project is described below.

1. **Headworks Facilities**:
    - Description: The Headworks is separated into two projects: Power Supply and Headworks. Power Supply will include a new power substation. Upgrades to the Headworks Facilities will include new wastewater pumps, improved screening and grit removal, and a new distribution building.
    - Status: The Power Supply and Headworks project, and related scopes including DCS Migration, Primary Clarifiers, and UV Upgrade are in varying stages of planning and execution.
    - Budget (2019): $408 million
    - Budget (2024): $518 million[8]
    - Scheduled Completion: 2026
    - Project Specific Context: The Headworks Project is being executed under a DB delivery model and has experienced cost and schedule pressures with over-expenditures currently totaling $56 million. The largest sources of pressure came from the NWI failure event amounting to $44 million, and differing ground conditions. The NWI failure occurred during a period of heavy rain when an exposed portion of the large pipe failed and flooded a construction area. This resulted in significant clean-up, repairs, and an overall delay to the Project.

[8] Headworks budget amendments, totaling $110 million, due to the Preferred Proponent's price exceeding the affordability threshold and costs associated with the Northwest Interceptor failure.

2. Biosolids Facilities

- Description: New facility to store and treat sludge produced from the treatment of wastewater to convert it into biosolids, a nutrient-rich product that can be safely re-used as fertilizer or soil.
- Status: In the procurement phase, having completed the procurement analysis and selected a PDB delivery model based on the result of the analysis and market sounding. Recently, the Project has received Standing Policy Committee approval on the preferred proponent with execution of the agreement expected in September 2024.
- Budget (2019): $553 million
- Budget (2024): $1.035 billion[9]
- Scheduled Completion: 2030
- Project Specific Context: The chosen delivery model for this Project, PDB, has not been undertaken by the City before. The award of the contract is currently awaiting approval, which while delayed from the Project's goal to award in the summer, is still on schedule if a decision is reached in September.

3. Nutrient Removal Facilities

- Description: New facility to biologically remove nitrogen and phosphorus from the wastewater to reduce the nutrient load on receiving waterbodies.
- Status: In pre-procurement, estimating, and planning and does not yet meet the threshold for establishing a MCPAC.
- Budget (2019): $828 million
- Budget (2024): $828 million[10]
- Scheduled Completion: 2030[11]
- Project Specific Context: The delivery model for the Nutrient Removal Project has not yet been selected. Development of the Class 3 estimate was occurring in spring 2024.

The budget numbers shown above are as provided by the City and reflect the information available at the time of this review. Full details on reported increases can be found in the Financial Status Reports ("FSRs") provided quarterly by the Project to the Standing Policy Committee on Finance and Economic Development. The Projects have experienced recent cost and schedule pressures including the challenges highlighted above on Headworks, and as reported in the FSRs, due to project delay, project financing, regulatory/scope increases, and like many projects undertaken over the past five years, market escalation. The Projects have also experienced a large turnover of personnel relative to the size of the Project team over the past two years.

In addition to the Project specific context provided above, the City established a strategic partnership with Veolia in 2011 to support all three Projects. The Veolia team support and augment the City team with major project experience in Project Controls, procurement, and risk management. The specific role of each Veolia team member depends on the position they've been requested to fill, example roles include providing Project Controls support and producing regular Project Controls reporting and providing major project procurement advice and supporting the procurement process. The City team is also supported by AECOM, the Owner's Advocate, whose

[99] Biosolids budget amendments totaling $482 million, due to an updated Class 3 estimate developed prior to project award, were based on rapidly changing market conditions and changes to project scope.
[10] Nutrient Removal cost estimate is currently under review.
[11] Nutrient Removal scheduled completion date is based on the regulated completion date and is currently under review.

role is to provide engineering and technical contract administration support to all three projects, including to review design submissions, respond to requests for information, help with change orders and milestone payment reviews. Further support and experience in alternative delivery models is obtained from Blakes for external legal council, Deloitte as an external financial consultant, and P1 Consulting as an external Independent Fairness Advisor.

The City's Audit Department engaged KPMG to complete an audit with the objective to evaluate the existence, effectiveness, and adequacy of controls (related to project governance and oversight, project leadership and organization, commercial strategy and management, and project delivery and risk management) on the Projects. Acknowledging that the Projects are currently facing challenges that are affecting the work and potentially increasing the risk and exposure profile of the Project, the Audit includes an evaluation of the nature and extent of factors contributing to these challenges and identifies opportunities for improvement in the Projects delivery and achievement of the Projects cost, schedule, and scope objectives. The objectives, scope and assessment criteria of the audit plan are outlined below.

2.2 Scope and Assessment Criteria

The audit included an evaluation of the three main sub-projects that comprise the Projects: Headworks, Biosolids, and Nutrient Removal, to identify opportunities for improvement in project governance and delivery. The review focused on the following areas:

- **Governance & Oversight**: including strategic alignment, decisions and escalation, stage gate process, key performance indicators, reporting and line of sight, and means to assure compliance.
- **Organization & Performance**: including organization and integration, leadership and behaviours, capacity and capability, and internal stakeholder management.
- **Commercial & Financial**: including contract strategy, procurement execution, and relationship management.
- **Delivery & Risk Management**: including cost, schedule and controls, risk management, contract and claims management, and processes and systems.

The assessment criteria are based on:

- **KPMG's Five Pillars of Major Project Success (the "Five Pillars")**: a proprietary framework designed to assess key aspects of project execution across five pillars, as shown in Figure 1, enabling an evaluation of factors that affect project performance and contribute to project success and failure,
- **Project Management Institute ("PMI")**: a global leader in project management, provides best practices for successful project delivery, and
- **Association for the Advancement of Cost Engineering ("AACE") International**: an association offering a comprehensive approach to project frameworks and delivery methods, emphasizing risk management, quality, and continuous improvement.

The review included examining the structures, reporting, and activities required to provide effective project oversight and governance, decision making, project delivery and risk management with the goal of identifying opportunities for improvement into a summary report complete with a roadmap of

actionable and prioritized recommendations. The Projects assessment focused on certain areas, as highlighted below, based on concerns identified in early 2024. Findings and recommendations are aligned to the Five Pillars. In some cases, an observation in an area excluded from this review was identified during the work. Where appropriate, these were recorded, and a recommendation developed.



Figure 1: Five Pillar Framework

The assessment criteria, derived from the objectives of each pillar, facilitated stakeholder engagement, project documentation review, gap analysis, and identification of improvement opportunities across the projects. The assessment covered the current stages of the Project lifecycles. Refer to Table 1 for further details on the objectives and assessment criteria.

Table 1: Five Pillar Objectives and Assessment Criteria

Pillar	Objective	Assessment Criteria, Considerations and Expectations
Governance & Oversight	Assess the governance and oversight processes through review of strategic alignment, decisions and escalation, stage gate process, key performance indicators, reporting and line of sight, and means to assure compliance including governance principles of alignment, autonomy, accountability, and disclosure.	• **Strategic Alignment, Decisions and Escalation:** Are the governance structure and processes resulting in delayed decision making? Is there a project governance body reporting directly to Council and a Project Sponsor at a senior executive level in the administration? • **Stage Gate Process:** Are there approvals to proceed without clear objectives, critical information, and structures or controls? Is there a fit-for-purpose Stage Gate Process with a formal documented outcome at each gate? • **KPIs, Reporting and Line of Sight:** Are there reporting processes in place to identify and address performance issues? Is there a "single source of truth report" with dashboard reporting? Are there KPIs that track performance against objectives? • **Means to Assure Compliance:** Are there independent third-party assurance exercises carried out to proactively identify the development of potential project failure modes? Is there ongoing project assurance and an independent performance monitor?

Organization & Performance	Assess the organization and performance through organization structure and integration, project leadership and behaviours, project team capacity and capability, internal stakeholder management, and organizational change management.	• **Organization and Integration, Leadership and Behaviors, Capacity and Capability:** Do projects have clear reporting lines? Are leadership authority and behaviors isolated in too few roles? Is there a project organization of sufficient size with relevant major project and delivery model experience? Is there a clear RACI that supports accountability, integration, and organizational alignment against outcomes? Are there elevated reporting lines and clear lines of sight to executive and Council? • **Internal Stakeholder Mgmt. and Organizational Change Mgmt.:** Is there integration with the rest of the City administration? Is internal stakeholder management effective? Has the organizational change management process been successful?
Commercial & Financial	Assess the project commercial strategy through a review of the contract strategy, relationship management, and procurement approach to ensure alignment with the project's risk profile.	• **Contract Strategy:** Is there a documented contract/commercial strategy in place and does it recognize the project complexity and risk profile? Is contract risk allocation between owner and contractor understood and defined? • **Relationship Management:** Are there strategies or plans in place to manage the relationship with the contractor(s)? • **Procurement Execution:** Is there a comprehensive procurement management/execution plan, including bidding requirements and evaluation criteria? Is there alignment between procurement execution and contract strategy?
Delivery & Risk Management	Assess project delivery and risk management through process and systems to control cost and schedule, processes to manage risk, and processes to manage contract and claims.	• **Cost, Schedule, and Controls:** Are there cost & scheduling reporting protocols and reporting metrics including a cost and schedule forecast? Is there a cost & schedule baseline to measure performance & change? Have the Project Controls requirements been reflected in the contract terms? Are there effective Project Controls and analysis of contractor reports and overall project performance? • **Risk Management:** Is there active risk management with up-to-date mitigation plans? Are the project risks to cost and schedule quantified and included in the forecast? Are project contingency and drawdown plans based on quantitative risk assessment of owner retained and shared risk? • **Change Control:** Is there a change control plan with related processes? Are there processes and systems in place to anticipate and plan for changes? Are the contract change management system and procedures adequate? • **Contract Management and Claims Management:** Is there a comprehensive contract management and administration plan based on contract terms? Are there processes to monitor contractor compliance in alignment with commercial structure of the contract? Is there a comprehensive claims management and avoidance strategy? Are there failures with identifying, managing, and mitigating claims risk? Are there processes and procedures in place and clearly defined roles and responsibilities for claims management including for administering claims and completing any required analysis? • **Processes and Systems:** Are there up to date, fit-for-purpose project plans and supporting documents?

Further information on the approach and methodology is set out in Appendix A of this report.

2.3 Key Risks

Our review considered risks to the City of Winnipeg related to both the governance and delivery of the Projects and to overall guidance and planning for any future major projects. Observations related to these risks are identified in Section 4 along with detailed recommendations to mitigate the risks. Risks included the following:

- **Project delays and cost overruns**: the magnitude of the scope and the rate of spend result in high risk of project delays and cost overruns related to factors such as delayed approvals or decision making and scope change.
- **Financial and reputational risk to the City**: the cost and public profile of the projects result in a high risk of negative impact on the City budget and reputation with stakeholders.
- **Public perception and confidence**: failure to deliver the project to the objectives results in a high risk of negative public perception and lack of confidence in the City.
- **Market interest in Nutrient Removal Project**: the performance of the City in delivering the Headworks and Biosolids Projects may result in a risk of low market interest in subsequent projects.
- **Attrition of project personnel**: the magnitude of responsibility for the project team (e.g., dollars of project spend per project team member) relative to compensation package result in a high risk of burnout and attrition of project personnel.
- **Contract claims**: the new (to the City) PDB contract model and the small City project team result in a high risk of contract claims resulting in cost overruns.
- **Inadequate contingency**: inadequately defined project contingency using quantitative risk analysis results in high risk of cost overruns and pressure on the City budget.
- **Ineffective risk transfer**: inadequately transferring or maintaining the transfer of risks results in a high risk of cost overruns.

3 Implementation Roadmap of Recommendations

The recommendations are grouped and prioritized for implementation considering the risk to the City and the benefit to the Projects. A rating for ease of implementation has also been included. Further explanations of the ratings and classifications are included in Appendices B and C.

The tables below provide two views of the summary recommendations. Table 2 organizes the recommendations by the structure of this review, i.e., KPMG's Five Pillars. Table 3 provides a view with the recommendations sorted into implementation themes identified by the Project Team. Links to the applicable detailed recommendation are provided in Table 2.

Table 2: Roadmap of Recommendations by KPMG's Five Pillars

Pillar	#	Recommendation	Priority (Urgent, High, Medium, Low)	Ease of Implementation (Easy, Moderate, Difficult)	Detailed Recommendation
Governance & Oversight	1	Governance Model	U[12]	D	1
	2	Stage Gates	H	M	4, 5, 6
	3	Project Sponsorship	H	M	1
	4	Delegation of Authority	U	D	2
	5	Reporting and KPIs	U	M	8, 9, 10
	6	Issues Escalation Protocols	H	E	3
	7	Review Project Objectives	M	E	7
	8	Project Assurance	H	M	11, 12
	9	Major Project Guidance	L	M	1, 13, 17, 24
Organization & Performa	10	Bolster Team Size / Capacity	H	M	14
	11	Org Charts and RACI	H	E	15, 16
	12	Internal Stakeholder / Organization Change Mgmt.	M	M	18, 19
Commercial & Financial	13	Progressive Design Build Contract Awareness	M	E	21
	14	Contract Risk Allocation	H	M	22, 25
	15	Interface Management	M	M	20
	16	Relationship Management	M	E	23
Delivery & Risk Management	17	Risk Management Plan	H	E	25
	18	Active Risk Management	H	M	26, 27, 28, 29, 30, 31
	19	Earned Value Management	H	M	38
	20	Project Cost and Schedule Reporting	U	E	8, 9, 36, 37
	21	Timely Change Control	M	D	32, 33, 34, 40
	22	Update Project Plans	H	M	19, 37, 39, 41, 42
App	23	NEWPCC Project Public Communication	H	M	43

[12] Revamping a governance model is a complex activity that may benefit from a staged implementation. Based on the timeline to get material in front of Council, planning for workshops to gain alignment on a revised governance model should commence within 3 months. Total implementation will take longer.

	24	Communication with Indigenous Communities	M	D	44
	25	Social Procurement	M	M	44

Of the 25 total summary recommendations, 4 were assessed as an urgent priority, 12 a high priority, 8 a medium priority, and 1 low priority. Section 4 contains the detailed findings including consequences and recommendations.

In Table 3 below, the recommendations within each theme are sorted by priority. A primary responsible party has also been defined for each recommendation. The responsible parties include the Project (Projects and Water and Waste Department), Corporate (City Administration and City Council), and Joint.

Table 3: Roadmap of Recommendations by Implementation Theme

Theme	#	Recommendation	Priority (Urgent, High, Medium, Low)	Ease of Implementation (Easy, Moderate, Difficult)	Responsibility
Governance and Delegation	1	Governance Model	U	D	Corporate
	4	Delegation of Authority	U	D	Joint
	3	Project Sponsorship	H	M	Corporate
	8	Project Assurance	H	M	Corporate
	21	Timely Change Control	M	D	Joint
	9	Major Project Guidance	L	M	Corporate
KPIs and Reporting	5	Reporting and KPIs	U	M	Joint
	20	Project Cost and Schedule Reporting	U	E	Project
	19	Earned Value Management	H	M	Project
Risk Management	14	Contract Risk Allocation	H	M	Project
	17	Risk Management Plan	H	E	Project
	18	Active Risk Management	H	M	Project
Resources	10	Bolster Team Size / Capacity	H	M	Project
Social and Indigenous	24	Communication with Indigenous Communities	M	D	Joint
	25	Social Procurement	M	M	Project
Project Management Plans	6	Issues Escalation Protocols	H	E	Project
	2	Stage Gates	H	M	Joint
	11	Org Charts and RACI	H	E	Project
	23	Projects Public Communication	H	M	Project
	22	Update Project Plans	H	M	Project
	7	Review Project Objectives	M	E	Project
	12	Internal Stakeholder / Org. Change Mgmt.	M	M	Project
	15	Interface Management	M	M	Project
	16	Relationship Management	M	E	Project
Training	13	Progressive Design Build Contract Awareness	M	E	Project

4 Detailed Findings with Consequences and Recommendations

4.1 Governance & Oversight

Positive observations:

- **Team communication, courage, and commitment:** Strong team communication has been built within the Projects where open communication between all members and a philosophy of engaging and escalating issues or items quickly has been established. The team has demonstrated commitment and courage through resolving outstanding claims and dealing with challenges including rebuilding the team and critical media attention.
- **Audit:** Projects were included in Audit Department Audit Plan due to risk to the City. This is in line with expectations, and it is recommended that the Projects continue to be included in future audit plans as part of ongoing assurance.

Strategic Alignment, Decisions, and Escalation Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
1 **NEWPCC Project Governance -** The Projects governance consists of the MCPAC which is established by the Water and Waste Director per the requirements of FM-004, Administrative Standard for Asset Management. The MCPAC membership requirements are defined in FM-004, and the committee reviews the projects on a quarterly basis (minimum). The governance and reporting structure flows up from the MCPAC to the Standing Policy Committee on Finance and Economic Development which reports to the Executive Policy Committee who then report to Council. This structure is designed for smaller, lower risk projects and is not fit-for-purpose for the cost, complexity and consequences associated with the Projects. Given the high cost and consequence of the Projects the MCPAC is too far removed from City Council in the reporting structure and the reporting timeframes take too long to report and receive feedback from Council. The current governance structure does not adequately support achieving appropriate alignment, accountability, autonomy, and disclosure to	**Urgent**	Inadequate major project governance and planning results in financial and reputation risk to the City.	1a) Implement a fit-for-purpose governance model that streamlines oversight and supports effective alignment, accountability, autonomy, and disclosure on the Projects The governance and oversight committee should be elevated within the City structure (e.g., elevated Project Sponsor, Chair, and single Council sub-Committee), be chaired by the CAO and report directly to Council. The governance committee review of project performance, including cost performance relative to budget, should occur monthly. Consider assigning a Sponsor role to a senior executive who has the authority to align the project goals within the City organization. Examples of Project Sponsors from industry for projects of this size include Chief Operating Officer, Chief Financial Officer, Executive Vice Presidents, Vice Presidents, or other members of the executive team. Revamping a governance model is a complex activity that may benefit from a staged implementation. Based on the timeline to get material in front of Council, planning for workshops to gain alignment on a revised governance model should commence within 3 months. Total implementation will take longer.	Corporate

	Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
	effectively oversee and monitor NEWPCC performance and risk (refer to Appendix F). The Project Sponsor role was assigned to the Water and Waste Engineering Manager by the Department Director, as per the requirements of FM-004. Typical industry approach is to assign a senior executive as Project Sponsor for a project of this size and complexity.	**Low**	Same as above	1b) Update FM-004 and the PMM, etc. to provide guidance for future 'major projects'. Provide additional guidance in FM-004, the PMM and the Investment Planning Manual related to very large, highly complex, high consequence projects that triggers consideration of appropriate governance, organizational change management, resourcing, alternative delivery models, public interest or communication assessment, and planning requirements to contain risk to the City. The Major Capital Project Directives ("MCPDs") and other risk-based criteria such as those identified in the PMM could be used to categorize the projects. This activity should be completed prior to planning the next major project phase (e.g., Biosolids construction phase).	Corporate
2	**Authority & Accountability** - The Projects follow an authority framework that is typical for City capital projects with one financial modification: the NEWPCC upgrades were given $30 million in delegated authority in 2010 (when it was one project of significantly lower cost). This was unique and recognized this project was different, however the amount has not kept pace with cost and delivery model. There is limited authority delegated to the project level which results in a misalignment between the authority and accountability on the Projects. Accountability is at the Project Director / Project Manager level and authority at the Department Director, governance, and City Council levels. Authority referring to financial authority along with decision making and staffing authority. A modification of financial authority was made for the project in 2010 with subsequent adjustments to the CAO level of authority in specific instances in 2018, 2022, and 2023. The adjustments resulted in selective increases to the financial authority on the project team. Industry practice is to assign accountability and authority, including financial authority within bounds, to the project team to allow efficient delivery between stage gates. The project level authority is balanced by the oversight authority and accountability of the project governance level. The goal is to assign authority to have lasting decisions made efficiently and effectively at the lowest practical level in the organization. Misaligned authority can hinder schedule sensitive projects like NEWPCC where delayed decisions can have high financial and reputational consequences.	**Urgent**	Delayed decisions can result in project delays, associated increased costs, potential for claims, and potential reduction in market interest for procurements.	Revise the decision and financial delegation of authority in alignment with project specific governance structure, including more delegated authority to empower the Project team to make timely decisions in support of project objectives, schedule, and contract requirements. Additional authority to be supported by: • A governance structure with experience in the scale and complexity of the project • Structured reviews at the stage gates and other critical decision points • Transparent reporting including an easy-to-use dashboard. Considerations should include approval of contingency use within stage approval constraints and phased awards of contract scope (e.g., the planned phases for the AECOM contract). It is typical industry practice to have authority delegated to the Project, within financial limits, for management of items within the initial approved budget / contract. The levels within the delegation of authority should be developed specific to the needs of the Project and through consultation with executive leadership and Council. They should consider the existing delegation of authority, project contracts and commercial structures, stage gate structure, governance structure, contingency drawdown curve, and City requirements/precedent. Consider an interim action to address this specific to Headworks, with a broader action for all Projects shortly thereafter.	Joint

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
3 **Escalation Protocols** - There is no documented protocol for escalation of issues and risks on the Projects. The Projects documentation lack definition of escalation protocols to guide team members, especially new ones, to the sorts of issues that require escalation. Currently, the Projects escalation, while working, is ad hoc and relies on the project team knowledge of what and where to escalate to ensure information required by decision makers is received in a timely manner.	**High**	Lack of documented protocols can result in errors, delay, and reputational damage to the City.	Develop and document project-specific escalation protocols and guidance. It is also suggested that additional guidance be added to the City governance process documents, including FM-004 and PMM, regarding development of escalation protocols for major projects.	Project

Management Response	Responsible Person [Title]	Implementation Plan Due Date [Date]
1a Management agrees with the recommendation. The NEWPCC Upgrade projects currently comply with all Council and administratively mandated policies, governance, reporting, financial standards and disclosures. Changes to FI-011 Asset Management Policy and FM-004 Administrative Standard – Asset Management will be proposed by the Director, Assets and Project Management, for Council consideration, by Q3 2025. If Council approves the proposed changes, the Director, Assets and Project Management will work to complete the necessary changes by Q2 2026. Timeline: * Changes to Governance Structure Plan proposed to Council: Q3 2025 * Implementation of approved Governance Structure Plan: Q2 2026	Director, Assets and Project Management	Changes to Governance Structure Plan proposed to Council: Q3 2025 Implementation of approved Governance Structure Plan: Q2 2026
1b Management agrees with the recommendation. Following Council consideration of the proposed governance changes contained in Recommendation 1a, the Director, Assets and Project Management, will make the necessary changes to the Project Management Manual and Investment Planning Manual. The timing of the Manual changes is dependent on Council approval of governance changes proposed in 1a.	See 1a	See 1a
2 Management agrees with the recommendation. A Winnipeg Sewage Treatment Program (WSTP) Major Capital Project Engineer (MCPE) will prepare an administrative report recommending delegated authority on the headworks, biosolids, and nutrient removal projects for Council approval. The report will outline delegated approvals for contract award and over-expenditures within the Council approved capital budget. Timeline: The delegation of authority report will be submitted in time to be heard at February 2025 SPC WWE.	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2025

3 Management agrees with the recommendation. A WSTP MCPE will document the escalation protocols currently used and incorporate into the project plan Timeline: February 2025	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2025

Stage Gate Process Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
4 **Projects Stage Gates & Overall Project Planning and Guidance** - A stage gate process is defined for the City and is being used on this Project. However, the process and structure for the gates was designed for smaller DBB projects and does not capture key requirements and scrutiny for large, complex, high-risk DB and PDB delivery models such as on the Projects. Stage gate requirements and major decision points require further definition for the Projects and commercial models.	**High**	Delays with the gate approval process expose the Projects to delay and additional costs.	4a Review and customize the standard project lifecycle to adjust the stage order and/or requirements to make it specific to the Projects, the selected delivery model (e.g., the planned PDB model for Biosolids), and existing contracts. Once approved by the governance authority, document in the project plan.	Joint
		Failure of the gate approval process exposes the City to additional risk.	4b Provide guidance in standard City documentation (e.g., PMM) that very large, highly complex, high consequence projects assess and customize the project lifecycle to apply specifically to the project and its delivery model.	Joint
5 **Projects Stage Gate Deliverables** - No evidence observed of defining stage gate deliverables in the project documentation. The PMM provides a sample list of stage gate deliverables for a DBB stage gate process. The gate deliverables for each project would need to be defined and approved in advance of the gate.	**High**	Failure to plan for stage gates exposes the project to delay and additional costs.	Define stage gate requirements and associated deliverables in the project planning documentation. Stage gates should be developed to be fit-for-purpose and based on the project delivery lifecycle. This can include industry standard classifications for certain deliverables, e.g., project cost and schedule and their expected range of accuracy. Requirements and deliverables should be developed such that approvers understand the cost, schedule, and risk profile of a large project as it progresses in planning.	Joint
6 **Projects Gate Readiness** - Approval decision is delegated through the City's framework and by the City governance model. The gate approval process and the parties involved are provided in the process charts, with some consideration of alternate delivery models. Some readiness criteria have been developed for the transfer / commissioning and close out stages, however, there is no stage gate readiness criteria developed for all project stage gates.	**High**	Uncertainty about project readiness may delay gate decisions.	Develop readiness criteria for key delivery gates that are reviewed by the governance structure. This can be built off of existing criteria for the transfer / commissioning and closeout phases to include all gates.	Joint

Management Response	Responsible Person [Title]	Implementation Plan Due Date [Date]
4a Management agrees with the recommendation. WSTP MCPEs will coordinate a project stage gate workshop. From this, a WSTP MCPE will draft a revised stage gate process suitable for the Projects. The final stage gate plan will be approved by the Major Capital Project Advisory Committee. Timeline: * Workshop will be held: December 2024 * Draft plan: January 2025 * Final plan: March 2025 * Approval of plan: June 2025	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q2 2025
4b The Director of Assets and Project Management will update the Project Management Manual Appendix G – Gating Process, to include stage gates for large, complex high-risk projects following the approval of the NEWPCC Upgrade projects gating process. Timeline: * Update Project Management Manual Appendix G – Gating Process: Q2 2026	Director of Assets and Project Management	Gating Process: Q2 2026
5 Management agrees with the recommendation. See recommendation 4a.	See 4a	See 4a
6 Management agrees with the recommendation. See recommendation 4a.	See 4a	See 4a

KPIs, Reporting and Line of Sight Findings and Recommendations:

	Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
7	**Review Project Objectives** - The program level objectives are defined for the NEWPCC Upgrade in addition to project level objectives (Headworks, Biosolids, Nutrient Removal). These are outlined in the Project Charters for each project. Criteria to measure performance against objectives is also outlined. Although the Project follows the PMM template to define its objectives, leading practice for projects of this size and complexity is to have additional objectives such as safety and reputation. The PMM specifies project objectives to be cost, scope, schedule, and quality.	**Medium**	Incomplete objectives may result in inability to achieve intended project benefits and misalignment in the City.	Assess the NEWPCC project objectives across all key areas of the project and add objectives as needed to address gaps including safety and reputation.	Project
8	**Project Reporting Dashboard -** Disclosure to the governance structure (i.e., MCPAC, Council committee, and council) is occurring in a variety of reports. The current reporting, which is presented in templates as required by the various regulating bodies (i.e., Financial Status Report ("FSR"), Investing in Canada Infrastructure Program ("ICIP"), Regulator), does not provide a transparent picture of the Projects status and performance. There is no one report that succinctly captures total performance against planned objectives. An easy to use, overall report summarizing performance and including KPIs across specific categories and geared towards overall project governance is lacking. The current executive summary of the cost and schedule report primarily focuses on the percentage of budget spent and the percentage of schedule completion. While these metrics provide a basic understanding of the project's progress, they do not offer a comprehensive view of the project's cost and schedule performance. Furthermore, these metrics do not provide any predictive insights into future cost and schedule forecasts, which are crucial for effective project management and oversight. The quarterly FSRs and the accompanying executive summary are produced per the requirements of FM-004. These reports also do not include key performance indicators such as the CPI or the SPI. These indices are important for evaluating the efficiency of the project's cost and schedule performance. The absence of these indices in the reports limits the ability to accurately assess the project's performance and to identify	**Urgent**	Lack of dashboard reporting with transparent metrics may result in inability to track and monitor overall project performance.	Develop a project governance report with an easy-to-use dashboard to provide a single report of project performance against objectives. The report would include project performance across safety, environment, cost, schedule, progress, quality, etc. along with key risks and issues. Commentary to address performance, risks, issues, and an explanation as to why a KPI is off plan, what actions are being taken to address the issue, and the expected outcomes should also be included. The information from this report could then be used to populate the other reporting required of the Project. The goal is a "single source of truth" report monthly. As part of the dashboard, include enhanced cost and schedule reporting such as performance relative to baseline, a forecast to complete, earned value, and performance metrics. Also include supporting narrative to guide readers to interpret the results. Refer to Recommendations #36 and #37 regarding reporting of cost and schedule performance metrics. The Project Controls monthly dashboard could also be included with the Administrative Report or report to MCPAC if appropriate. Consider an interim action to address this specific to Headworks, with a broader action for all Projects shortly thereafter.	Joint

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
potential issues early on. Refer to Observation #36 and #37 for further details regarding Project Controls reporting. It is also not evident in existing administrative reporting what actions are being taken to address issues when KPIs do not meet the plan. It seems the template required to produce the quarterly Administrative Reports may limit the type of information communicated to the MCPAC, the Standing Policy Committee on Finance, and Council.				
9 **Project KPIs** – Current governance/administrative reports do not report on Project KPIs beyond cost and schedule. Therefore, some project objectives are not represented in KPIs or otherwise reported (e.g., compliance with health and safety requirements, quality, etc.).	**Urgent**	Lack of KPI reporting may result in inability to achieve intended project benefits.	Develop KPIs and associated reporting requirements related to safety, quality, and additional project elements. KPIs are typically presented in a dashboard report which includes the actual results, the target results, and the variance between the two. Refer to Recommendation #8 above.	Joint
10 **Frequency of Governance Reporting** - The MCPAC Administrative Reports are currently reported quarterly. Although the Project follows the current FM-004 standard which is to report financial data quarterly, for a project of this size and complexity, the financial reporting to the project governance is infrequent compared to industry standard.	**High**	Infrequent cost and schedule oversight may result in failure to meet project objectives.	Increase the frequency of governance oversight reporting to monthly. Refer to Recommendations #8 and #9 above regarding enhanced reporting.	Joint

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
7 Management agrees with the recommendation. WSTP MCPE will update the project charter to include safety and reputation objectives. **Headworks and Biosolids**: the project charters will be revised to include additional objectives. **Nutrient Removal:** the project charter will be created and will include the additional objectives above the PMM requirements. Timeline: All project charters to be updated or created by January 2025.	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2025
8 Dashboard: Management agrees with the recommendation for a project dashboard for Biosolids and Nutrient Removal. Given the stage of construction for Headworks, developing a specific milestone-based dashboard is not recommended as the project will be near completion at implementation time.	WSTP Controls Manager	Identify KPIs for dashboard inclusion: Q1 2025 Purchase software: Q2 2025 Implement dashboard: Prior to signing Design Build Agreement

Management acknowledges the urgency of this work. The WSTP Controls Manager is leading this initiative to purchase and/or develop/customize a software program. The NEWPCC project team has already begun reviewing options for a revised dashboard. The dashboard will include reporting on KPIs related to project objectives (such as budget, schedule, scope, safety, reputation) as well as key project risks and mitigation strategies, and Earned Value Analysis for applicable contracts. A WSTP MCPE will outline critical KPIs that should be included in the dashboard. The frequency of the dashboard reporting will increase from quarterly to monthly to MCPAC. If a new governance board is established per Recommendation 1, the reporting will be monthly to that governing body. Timeline: * Identify KPIs for dashboard inclusion: Q1 2025 * Purchase software: Q2 2025 * Implement dashboard: Prior to signing Design Build Agreement (DBA) for Biosolids (approx Q2 2026) * Increase reporting to monthly to MCPAC after dashboard implementation: Approx Q2 2026		(DBA) for Biosolids (approx Q2 2026) Increase reporting to monthly to MCPAC after dashboard implementation: Approx Q2 2026
9 Management agrees with the recommendation. See recommendation 8	See 8	See 8
10 Management agrees with the recommendation. See recommendation 8	See 8	See 8

Means to Assure Compliance Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
11 **Project Assurance** – Project assurance provides confidence to senior leaders and stakeholders that work is controlled and supports successful delivery of project objectives. While City Audit conducts point in time assessments of the Project against defined criteria, providing insight into Project risks, there is currently no assurance function supporting the Project's governance/oversight to provide ongoing independent assessment of the Project's performance, risk profile, issues, or reporting.	**High**	Lack of independent perspective may result in lack of confidence in Projects delivery.	Develop an ongoing Project assurance function independent from the Project team as an extension of the Project's governance and oversight structure. The assurance function should analyze the Project's performance against key metrics and risks and have a direct reporting relationship to the Project governance committee. This function should have requisite major project experience. This would be in addition to continued inclusion in the City's Audit Plan.	Corporate
12 **Audit Planning** – The Projects were included in the Audit Department Audit Plan based on an assessment of the risk profile. Based on the size and complexity of the Projects, they should continue to be included as part of the audit program. An external audit of the capital cost estimate was also conducted on the Project in 2019.	**Low**	Lack of scrutiny of major projects exposes the City to cost and reputational risk.	Refer to Recommendation #11 regarding additional means to assure compliance.	Corporate
13 **Overall Project Planning and Guidance** – There is no regular or ongoing arrangements for third party reviews or project assurance as part of standard City practice. The size and complexity of megaprojects can put a strain on the capacity of a public service organization required to independently verify or validate strategies, costs, schedules, etc. The need for assurance measures such as independent verification and validation or audits is identified in Appendix G of the PMM as part of the Stage Gating Process. However, there are limited details on what and how this is achieved.	**Low**	Lack of project assurance exposes the City to cost and reputational risk.	For large high-risk projects, establish guidance regarding project assurance requirements into overall City planning documentation (e.g., PMM) to reduce overall risk to the City. Project assurance activities should be applied proportionally to the risk and value of the projects. The PMM should provide guidance on estimate reviews, QRA and Schedule Risk Analysis ("SRA"), project audits and a threshold (risk or dollar based) for engaging a project advisor.	Corporate

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
11 Management agrees with the recommendation. An additional staff member in the Assets and Project Management Department, Major Capital Project Oversight Division will be required to address the recommended assurance functions. Additional external resources are anticipated to be required. The Director of Assets and Project Management will submit a budget request for the resource as part of the 2026 budget submission. Timeline: * Request budget for new APM staff member: Q4 2025 * Council approves budget for new APM staff member: Q1 2026 * Post new APM Job Posting: Q2 2026 * Hire new APM staff member: Q3 2026 * Provide Independent Project Assurance Function: Q4 2026	Director of Assets and Project Management	Request budget for new APM staff member: Q4 2025 Council approves budget for new APM staff member: Q1 2026 Post new APM Job Posting: Q2 2026 Hire new APM staff member: Q3 2026 Provide Independent Project Assurance Function: Q4 2026
12 See 11	See 11	See 11
13 Management agrees with the recommendation. The Director, Assets and Project Management will complete this recommendation as part of the work to address Recommendation 4b.	See 4b	See 4b

4.2 Organization & Performance

Positive observations:

- **Building Capacity:** Concerted effort has been put into rebuilding the Projects team with a focus on addressing key gaps and reducing the risk of further attrition.
- **Dedicated Project Team:** The Projects team is comprised of dedicated members who are committed to the success of the Projects. This includes the collaboration and integration with Veolia.
- **Strategic Partnership:** The strategic partnership established by the City of Winnipeg is seen as beneficial by Project team members. It allows the Projects to supplement the City of Winnipeg personnel with additional resources quickly and on an as needed basis including with relevant major project experience in areas such as Project Controls, major procurements and risk management.

Organization and Integration, Leadership and Behaviors, and Capacity and Capability Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
14 **Project Team Size and Capacity –** NEWPCC has adopted the standard City approach to project organization, where possible. This approach anticipates a DBB delivery model for routine capital projects and is not providing the required capacity or capability to effectively manage the Projects. NEWPCC therefore has had to deviate where required, including the partnership with Veolia and some adjustments to job classifications for the current team. The City Project team is comprised of eight full-time personnel at the time of this review, including a Project Director, two Senior Project Engineers, one Project Manager, and four support roles (e.g., project engineer, project coordinator, project officer) plus a part-time finance support role for reporting. The City team is bolstered through the use of the Veolia partnership, including for Project Controls and procurement support. The Projects owner team is small relative to industry practice. Due to the relatively small Project Owner team, there are challenges in managing the workload for a project of this size and complexity, including resources to support negotiating and managing funding agreements, risk management, contract management, rightsholder participation management and social procurement, public communication, and operational representation. The Projects recently received approval for four more Senior Major Capital Project Engineers and are in progress fulfilling these roles. The City staff assigned to the Project have experience in project execution, but have limited major project experience as very few projects of this size and complexity have been undertaken by City staff. To mitigate this gap in major project experience, the City has paired their senior project engineers with advisors from their strategic partner Veolia, to supplement their existing knowledge. The current Project Director assumed the role in October 2023 and has focused on rebuilding the team after a period of high turnover. The Projects recently received approval for four more Senior Major Capital Project Engineers and are in progress fulfilling these roles. The staffing plan includes new hires in the short term, with longer range staff planning in progress. The Project has previously requested and were rejected two	**High**	Under-resourcing the project may result in cost, schedule, and reputational risk.	Review the team size, capacity, and capability to reduce the load on individual team members, risk to the City and impact of change of personnel. Include other key elements as follows: • Develop succession planning and review of levels and compensation for key roles to maintain an adequately competitive position. • Add more major project experience to support critical areas including reducing the scope of the Project Director role or adding support to that role. • Suggest a Gantt or other chart format for staff planning across project phases. The size of an Owner team is dependent on the stage and commercial model of the contract. Examples of public projects of comparable size to the Projects with Owners Engineers onboard, at a project stage in advance of awarding major contracts, and planning to use DB, PDB, or Design Build Finance (“DBF”) models had Owner teams with approximately 20-30 personnel, with plans to ramp up upon award of contracts and start of construction. These projects also had a selection of consultants in specialist roles (e.g., legal, commercial, risk, etc.).	Project

	Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
	permanent full-time positions through the annual operating budget submission. Following that, the Project requested temporary full-time positions as part of the capital budget approval. The scope of the Project Director is to oversee the Winnipeg Sewage Treatment Program which includes projects at the North, South and West End facilities while typical industry practice is that a project director or equivalent for a major capital project is not also overseeing capital projects at other facilities. Project reporting currently occupies a large percentage of Project Manager timetime, and more staff are required to support the amount of reporting required for a project of this size and complexity.				
15	**Project Organization Charts –** Project organization charts are out of date and do not adequately identify reporting lines. It is understood that the Projects report into the Water and Waste Department, with the Project Sponsor as the Manager of Engineering for Water and Waste. The Manager of Engineering / Project Sponsor reports to the Director of Water and Waste who is responsible to Council for the delivery of the projects. Integration with other City departments is through normal channels supported by existing relationships and MCPAC members. It is understood that individuals on the Project understand who they report to.	**Medium**	Lack of up-to-date organization charts may cause confusion, including with other project stakeholders, resulting in delays and additional costs.	Update the Projects governing documents and organization charts to include the following: • Illustrating reporting lines to show unambiguous reporting lines of authority and communication. • Layouts should reflect the organization structure. • Updating administrative details in the documents including titles, legends, and dates/revision control. • Consider including key contractor interfaces (e.g., Headworks Project Manager with a dotted reporting line to the AECOM Project Manager)	Project
16	**Project RACI** – The Project responsibility matrix is out of date and does not adequately outline the accountabilities / responsibilities for all key tasks, e.g., contract administration. The current environment also concentrates accountability / responsibility in a small number of roles. Most accountability sits at the Project Manager / Project Director level with most authority higher in the governance structure. Refer to Observation #2 for further details.	**High**	Lack of up-to-date RACI matrices may cause confusion and a single role with too much responsibility may create a bottleneck or attrition resulting in delays.	Update the NEWPCC Project Responsibilities Matrix to include all projects and all key tasks. Review and balance accountability / responsibility across the project team as appropriate. Refer also to Recommendation #2 related to balancing authority and accountability.	Project
17	**Overall Project Planning and Guidance** – FM-004, Administrative Standard for Asset Management, provides a mechanism for estimating the cost of a team to manage	**Low**	Under-resourcing a team may	Review and update current guidance for resourcing large, high complexity and consequence projects. This could include defining “adequately resourced’ in the PMM and the FM-004, and evaluating	Corporate

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
complex mega-projects and including that cost in the overall capital cost of the project. However, there is limited guidance on what an adequately resourced project team looks like for a major capital project.		result in failure to adequately manage a project.	the current resourcing mechanism to address staffing, retention, and succession concerns (especially for long duration projects). The existing mechanisms in FM-004 and the PMM such as Administrative Overhead Charges should be adequate to support an estimate of the owner team costs with some additional guidance on what a major project team could look like.	

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
14 Management agrees with the recommendation. The Manager of Engineering and Project Director have been working to supplement the project team with additional resources. Since the audit, new Senior Major Capital Project Engineer positions have been created (one for each of the major Projects). Three MCPEs have been hired. Recruitment is in progress to backfill vacant positions. A new position to assist with Indigenous communication and social procurement is currently being recruited for. Additional strategic positions are required to fulfill the recommendations of the audit. Some positions will be supplemented through additional Veolia resources. All FTEs will be funded from the NEWPCC Upgrade projects; this will require additional capital approval. The WSTP team will seek Council concurrence on the addition of the new positions. Critical positions for the WSTP: * (1) Communications Consultant (third party resource to be contracted on an as needed basis) * (1) Contract Manager for Owners Advocate Contract (new internal resource) * (1) Accountant (new internal resource) * (1) Nutrient Removal Operations Liaison (new internal resource) Critical positions for a Project Controls group: * (1) Contract Interface Manager (Veolia resource) * (1) Claims specialist (third party resource to be contracted on an as needed basis) * (2) Cost Controllers (Veolia resources - one for HW/NR; one for BS) * (1) Risk Manager (Veolia resource) Timeline: * Position descriptions and budget estimates for positions: January 2025 * The report for Council approval to hire additional resources: submitted for SPC WWE early Q2 2025 * Create the posting packages for all positions to be complete within two months of Council approval * Target posting 50% of positions within three months, and 100% within six months, of Council approval * Target filling 50% of positions within three months, and 100% within six months, of posting	Manager of Engineering and Project Director	Position descriptions and budget estimates for positions: Q1 2025. The report for Council approval to hire additional resources: submitted for SPC WWE early Q2 2025.

* Timing to meet this recommendation will be dependent on availability of qualified candidates to fill the roles and are subject to additional Council approval to hire new FTEs. Additional budget will be required and incorporated into the Nutrient Removal project.		
15 Management agrees with the recommendation. A Project Engineer/ Coordinator will update organizational charts for Headworks and Biosolids and create the organizational chart for Nutrient Removal. Updated charts will be included in the respective project plans. Timeline: Organizational charts to be complete by December 2024.	Project Engineer/ Coordinator	Q1 2025
16 Management agrees with the recommendation. A Project Engineer/ Coordinator will update RACI charts for Headworks and Biosolids and create the RACI chart for Nutrient Removal. Updated charts will be included in the respective project plans. Timeline: RACI charts to be complete by December 2024.	Project Engineer/ Coordinator	Q1 2025
17 Management agrees with the recommendation. The Director of Assets and Project Management will complete this recommendation as part of the work to address Recommendation 1a.	See 1a	See 1a

Internal Stakeholder Management and Organizational Change Management Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
18 **Internal Stakeholder / Organization Change Management**–- The Projects objectives are clearly defined for the included categories (refer to Observation #7 for detailed observations and recommendations for additional objectives) and communicated across the City Administration. However, the interactions and effects of the size and alternative delivery methods used for the Projects on other City processes and procedures (e.g., coordinating permitting with preliminary or developing design information instead of final design as per the usual process) was not adequately considered in project planning, which can lead to issues and impacts on cost and schedule	**Medium**	Lack of internal stakeholder management and organizational change planning result in delays	Develop an organizational change management strategy and internal stakeholder communication plan to support understanding of the project and the delivery model and getting stakeholders onboard with the project requirements and decisions.	Project
19 **Outdated Project Documentation**–- Outdated project documentation, including key documents like the NEWPCC Project Plan and Project Charters, pose a risk to the efficient onboarding and integration of new staff, potentially reducing their ability to contribute effectively to the project.	**High**	Outdated documentation results in inefficient onboarding and the potential for confusion during project delivery.	Update and maintain project plans as “live” documents to support delivery and onboarding of new personnel. A training and onboarding plan should be added to the project plans. Regular updates to project documentation to occur as required throughout project delivery.	Project

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
18 Management agrees with the recommendation. A WSTP MCPE will create an organizational change management strategy and internal stakeholder communication plan for all projects. This will outline project objectives, stakeholder lists, contact lists and indicate frequency of communication. Any project specific deviations from the plan will be documented in the project plan. Timeline: This plan will be completed by Q1 2025.	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2025
19 Management agrees with the recommendation.	WSTP Project Engineers	Q1 2025 Reviews of key documents to be conducted yearly, and

WSTP Project Engineers will update the project plans to include a training and onboarding plan. Project Charters will also be reviewed and revised as applicable for each project. Headworks and Biosolids: the existing documents will be reviewed and revised. Nutrient Removal: the project documents will be created. Key project documents will be reviewed at major project milestones/stages or at least annually. Timeline: * All project charters to be updated or created by January 2024 (recommendation 7) * All project plans to be updated or created by March 2025 * Reviews of key documents to be conducted yearly, and documented on the revision/review log		documented on the revision/review log

4.3 Commercial & Financial

Positive observations:

- **Contract strategies:** Project-specific contract strategies have been developed for each project in line with expectations and industry practice.
- **Procurement options analysis:** Project-specific procurement options analysis has been completed for Headworks and Biosolids Projects and is planned for Nutrient Removal. This is in line with expectations and industry practice.
- **Procurement evaluation framework:** Detailed evaluation framework documents exist for the procurement process for the Biosolids Project, including for shortlisting and preferred proponent selection. These evaluation frameworks include key elements such as role, responsibilities, processes, and criteria.

Contract Strategy Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
20 **Contract Interface Management Plan**–- Project specific contract strategies have been developed and analysis was completed to assess the strategy relative to the project complexity and risk profile. Strategies or plans for managing key contract interfaces are not clearly outlined, including for interfaces between contracts or scopes within a project and for between the three main projects (i.e., Headworks, Biosolids and Nutrient Removal).	**Medium**	The absence of clear strategies for managing key contract interfaces can lead to inefficiencies in project execution.	Develop contract interface management plan(s) for the main contract interfaces. This can be included as part of other Project documents, e.g., the Project Execution Plan, Contract Strategies, or Contract Management Plan.	Project
21 **Delivery Model Awareness**–- The main contract as part of the Biosolids Project is being undertaken as a PDB. This form of delivery model was selected based on what the market is currently willing to accept, is new to the City of Winnipeg and therefore there is limited precedent within the City for executing a project under this model. The differences between the PDB model and a DB or DBB model are not accounted for in the project processes including for example, effective risk management and commercial oversight to manage the PDB conversion risk, resourcing, and process requirements to facilitate open, collaborative, and timely design review and development, and differences in design completion at stage gates.	**Medium**	Unfamiliarity with the PDB delivery model could lead to project management and oversight challenges.	Continue to hold awareness/education session(s) with all Biosolids Project stakeholders regarding a PDB delivery model and its differences when compared to previously used delivery models such as DB or DBB. These sessions should extend beyond the Water and Waste Department and include other departments affected by changes in workflow or processes, such as permitting. Capture the unique requirements in project processes, City involvement and collaboration in project-specific management plans and documentation developed. The content for the session should include key highlights from the contract (e.g., commercial model, risk allocation, schedule milestones, PDB conversion overview, etc.) along with specific elements relevant to the various City stakeholder groups (e.g., design review process, design completion percentage at stage gates, permitting requirements, etc.). It should also specifically highlight where risks, resourcing/involvement and process differ from traditional delivery models typically used by the City.	Project
22 **Contract Risk Allocation**–- As part of the Headworks project contingency development, a project risk register was developed in 2018 with project specific risks identified and risk ownership assigned. However, there is evidence that some of the transferred risks could have been more actively managed. Refer to Observations #25 and #26. Active management helps to ensure the City does not inadvertently assume ownership of a risk transferred to the contractor. A contract risk allocation exercise was also completed to support the development of the Biosolids development phase agreement. However, a similar contract risk allocation exercise has not yet occurred for Biosolids execution phase and Nutrient Removal as contracts have not yet been awarded for those	**High**	If transferred risks are not actively managed, the owner may unintentionally assume a contractor's risk, leading to unforeseen liabilities or delays	Increase frequency in monitoring contractual risks as part of the Project's risk management plan (refer to Recommendations #25 and #26). Complete a contract risk allocation exercise for the execution phase of the Biosolids Project and Nutrient Removal, as planned when the project progresses into procurement and contracting. The risk allocation exercise should clearly define contract risks as retained, transferred, or shared with the main contractor for the project agreement.	Project

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
projects. The risk allocation should identify risks as retained, transferred, or shared with the major contractor.				

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
20 Management agrees with the recommendation. See recommendation 14 for new Contract Interface Manager resource ask which should be complete by Q4 2025. The new Contract Interface Manager will create the Contract Interface Management Plan following their hire. Timeline: * Draft Contract Interface Management Plan: February 2026 * Final Contract Interface Management Plan: March 2026	Contract Interface Manager	Q1 2026
21 Management agrees with the recommendation. The Biosolids team has done significant training on PDB. Veolia is providing PDB training in Fall 2024 to the broader City (including permitting, legal, procurement, and corporate staff) and Veolia staff not working on Biosolids. Internal training has been ongoing for project staff in preparation of the Biosolids project and includes: 1) Multiple WSTP Project Managers and Program Directors have attended the Design Build Institute of America Conferences from 2015 to 2024 2) Progressive Design Build Done Right Training through Design Build Institute of America in Oct 2021 3) Early Contractor Involvement Informational Session by Blakes in Oct 2021 4) Veolia's Experience with Progressive Design Build Informational Session in Nov 2021 5) AECOM's Experience with Progressive Design Build Informational Session in Nov 2021 6) Fundamentals of Collaborative Delivery and Progressive Design Build Training through Water Collaborative Delivery Group in June 2024. Training will continue throughout the project and will also incorporate additional training in risk management. Current planned training includes: 1) Veolia will provide training to the broader City and Veolia staff who are currently not working on Biosolids. Timeline: Q4 2024 2) AECOM to provide training on Achieving an Acceptable Guaranteed Maximum Price. Timeline: Q4 2024 3) Water Collaborative Delivery Group to provide training on Essentials of Collaborative Delivery Risk Allocation and Contracts Timeline: Q3 2025	See Management Response	Q4 2025

4) Water Collaborative Delivery Group to provide training on Implementation Phase of the Progressive Design Build Timeline: Q4 2025 Information on delivery models will be developed and included on the NEWPCC project websites for external resources. Timeline: within six months of filling the Communications Lead position Information was previously provided for elected officials with approval authority. An information session will be developed for the proposed governance body for the NEWPCC Upgrades. Timeline: Recommend this training is delivered within three months of the body being appointed. The training can also be recorded to enable easy review as the project progresses or new people come on board.		
22 Management agrees with the recommendation. In June 2024, the City began evaluating the Veolia risk management tool that has the ability to delineate ownership of risks. The population of WSTP project risks for Headworks has been included in this tool. The plan is to implement all risks into this tool for all three projects. A Quantitative Risk Assessment (QRA) was completed for Headworks in October 2018 and March 2021, and for Biosolids in March 2022. * Headworks: The HW MCPE will review the current risk allocation to ensure its accuracy. They will determine a revised remaining risk contingency budget by completing a new QRA. The HW MCPE will monitor realized and unrealized risks and also monitor and track contingency budget versus outstanding risk amounts. Timeline: Start monthly monitoring of risks to begin Q1 2025; this will be documented in the risk review log. Review existing risk allocation by Q1 2025. Headworks QRA will begin in Q2 2025 * Biosolids: The BS MCPE will negotiate the risk allocation with the Development Partner as part of the Development Phase Agreement. Negotiations will continue until execution of the Design Build Agreement. The BS MCPE will monitor realized and unrealized risks and monitor and track contingency budget versus outstanding risk amounts throughout the implementation phase. Any lessons learned from Headworks will be implemented for Biosolids. Timeline: Start risk allocation negotiations in Q1 2025. Risk allocation to be finalized as a deliverable of the DPA prior to signing the DBA which is anticipated Q2 2026. Monthly monitoring of risk to begin Q1 2025, which will be documented in the risk review log. * Nutrient Removal: The NR MCPE will create a new risk register complete with planned risk allocation. A QRA will be undertaken to determine a risk contingency budget for the business case. Any lessons learned from Headworks and Biosolids will be implemented for Nutrient Removal. Timeline: A risk register and associated risk budget will be developed by Q4 2024. Quarterly monitoring of risk contingency budgets to begin Q1 2025 throughout the planning and procurement phase. Reviews will increase to monthly following engagement of the design-build consortium. Risk reviews will be documented in the risk review log.	See Management Response	Q2 2025

Relationship Management Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
23 **Relationship Management Plan**–- A formalized project specific relationship management strategy or plan is not in place. The plan would outline the strategies and tactics for managing the contractor relationship so that issues can be resolved prior to the use of the formal, contractual dispute resolution processes included in the project contracts. Informally, it is understood that the strategy for managing the relationship with the contractor is through consistent and open communication, including regular coordination meetings at the project and executive level. It is understood, through interviews with various project team members, that there are no current concerns with the relationship with the main contractor on the Headworks project. It is also understood, through interviews, that the Senior Executive Steering Committee meetings are taking place as outlined in the DB agreement on the Headworks Project.	**Medium**	The lack of a defined and dedicated plan to managing the relationship with the contractor may present opportunities for strain or tension between the parties which may affect overall project delivery.	Document the plan for relationship management with the major project contractor(s). This can be included as part of the contract management plan.	Project

Management Response	Person Responsible [Name, Title]	Implementation Plan Due Date [Date]
23 Management agrees with the recommendation. A WSTP MCPE will document the current practices to manage relationships with the contractor and include in the contract management plan for each project. Timeline: February 2025	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2025

4.4 Delivery & Risk Management

Positive observations:

- **Change Control:** The project change control process outlined in the PMM is aligned with expected change processes on major projects and has been implemented on the Projects. The review and approval of changes is not timely due to the lengthy approval process.
- **Project Controls**: The Project Controls Plan outlines the purpose, scope, methodology and requirements to track and forecast cost and schedule based on the defined performance metrics with regular Project Controls reports. Some of the metrics in use are not appropriate for the contract / payment structure.
- **Document Management**: Document control protocols are aligned with leading practices and document management appears to be performing well and is supported by a document management system. The document management plan for Headworks appears to be effectively implemented.

Risk Management Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
24 **Guidance for Large Complex Project Risk Management**–- The City's guidance documents, such as FM-004 and the PMM, along with the Project Risk Management Approach (PG-RM-PC-02), fail to provide sufficient direction for effective risk management, especially for large, high risk, high consequence projects and underestimates the effort required for risk management in large projects. This deficiency is evident in the absence of clear instructions on escalation protocols and the use of a Risk Breakdown Structure ("RBS").	**Low**	Guidance documents not aligned to the size and scale of NEWPCC may result in inadequate risk management.	Revise the PMM guidance for managing high-risk major projects to effectively handle risks in complex projects, defining triggers and protocols for escalation, introduction of an RBS, and enhancing the Quantitative Risk Analysis ("QRA") requirements for cost and schedule risk. The City should enhance its focus on Risk Management as a tool for effectively managing projects.	Corporate

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
25 **Risk Management Plan -** The Headworks Project Charter inadequately assessed the project's size and complexity (including the probability of complex management challenges) with a low-probability assessment to be mitigated through procurement. This low evaluation may have led to insufficient planning, management challenges, and resource overburdening. The Headworks Project Risk Management plan falls short of risk management standards including AACE and PMI, lacking clear risk evaluation criteria, defined processes for risk escalation and management, and clear role delineation. The AECOM Project Execution Plan's Risk Management Section 6.6 is insufficient, only addressing risk update timing and neglecting critical aspects such as roles, responsibilities, accountabilities, and risk quantification. The Design Builder's Risk Management Plan lacks essential information and guidance, failing to detail quantitative analysis processes and align its risk evaluation criteria with the City's or project's criteria. The magnitude scale used is also unclear.	**High**	Inconsistent risk management plans and absence of risk criteria may result in understating risks.	In addition to the risk registers the Projects currently use to monitor risk, develop a risk management plan that reflects the size and complexity of the projects. The risk management plan should include key elements such as clear risk evaluation criteria, defined processes for risk escalation and management, and clear role delineation, QRA requirements, and reporting of top risks. A plan should be developed for all projects, support the implementation of active risk management, and be forward-looking and tactical with assigned responsibility and minimum of monthly updates. For Biosolids and Nutrient Removal the plan should include an overall forward-looking risk management strategy for the project based on lessons learned from Headworks. This can include lessons already gathered through lessons learned sessions undertaken by the Project team.	Project
26 **Active Risk Management and Risk Registers** – The frequency of active risk management and risk reviews should be increased on the Projects. The AECOM Risk Register for the Headworks Project was last updated in March 2023 as formal risk workshops were put on hold due to the Northwest Interceptor Failure in June 2023. It is our understanding risk review workshops have resumed, however the risk register from the June 2024 workshop was not available for review as part of this audit. Risk registers are missing some key information such as due dates, individual position/role titles assigned to each risk, and separate schedule impacts for schedule risk analysis. It is understood that the Project held weekly meetings when high risk activities were upcoming (e.g., lining of the Main Street Interceptor). The meetings included attendance from RRS, the City Project team, the City Operations team, and AECOM. Discussions were documented in meeting minutes and risks and mitigations were updated weekly for the specific scope. The Monthly Project Report provided by Red River Solutions ("RRS"), the main DB contractor on Headworks, lacks comprehensive status of risk management activities, including important details like Mitigation Action Due Date and Risk Mitigation Status.	**High**	Outdated risk registers can lead to poor risk management, unexpected threats, missed opportunities, and resource misallocation.	Increase frequency of active risk management on the Projects. Risk registers should be maintained with up-to-date mitigation plans including status, along with due dates, individual position/role titles assigned to each risk, and schedule impacts. New risks should be added as they occur, and obsolete risks should be removed. A risk breakdown structure can help with focusing on relevant risks for the project stage. Industry practice for projects of similar size and complexity is to review and update risks at least monthly for each Project with more frequent reviews required for initial development and periods of high activity (reduced frequency may be appropriate during periods of low activity), refer to AACE 62R-11 Risk Assessment Identification and Qualitative Analysis for additional guidance.	Project

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
The magnitude scale used by RRS is unclear due to the absence of evaluation criteria in the monthly RRS Risk Register reports, and risk descriptions do not support effective risk mitigation. The Project Charter for the Headworks Facilities may underestimate the cost and schedule impacts of high-severity risks.				
27 **Risk Management Resourcing** - The Headworks project team lacks sufficient risk management resources. Major projects require a concerted effort to achieve effective risk management. Typically, major projects of this size would have a dedicated resource in a role such as Risk Management Lead, with support from Project Management, Project Controls and external contractors to develop risk mitigation plans, complete risk register updates, and conduct QRAs. In some cases there may also be an additional support role to maintain the risk register and produce reporting.	**High**	Insufficient resources can lead to ineffective risk management, as the team may not have the capacity to identify, assess, mitigate, and report all potential risks.	Review resourcing for risk management activities and allocate responsibility for risk management reporting to the Project Director / Project Managers. Resources are required for the following: • Headworks to implement tactical risk management through to project completion. • Biosolids to implement lessons learned and position the team for contract award. • Nutrient Removal to implement lessons learned and position the team for procurement. Dedicate a resource in a role such as Risk Management Lead, and consider an additional support role if required.	Project
28 **Project Contractor Risk Reporting** – The main DB contractor on Headworks appears to be fulfilling their risk reporting obligations; however, the reported information does not communicate key items, such as delineation of top risks (including severity and mitigating action status) and trending of risks (new, increasing or decreasing in severity). Severity of risks is included in the risk register, however, top risks (including their severity) are not reported.	**Low**	Absence of clear reporting of key risks resulting in poor oversight to manage risks.	Project Manager and Project Director to evaluate and consider guidance be provided to the main DB contractor on Headworks to enhance risk reporting to include: • Top risks, including risk severity and commentary on mitigation status. • Trending risks (new, increasing, reducing). This guidance may be over and above what is contractually required of the contractor and may therefore result in additional cost. Consideration for action is at the discretion of the Project Manager and Project Director. The suggested reporting enhancements may be applied to future contracts not yet awarded to improve the Project's ability to manage risk effectively.	Project
29 **Projects Risk Reporting** – Current Project reports fail to effectively communicate severity and management of top risks, in particular risk materiality/impact and trend.	**High**	Absence of clear reporting of key risks resulting in	Improve risk reporting by: • Reporting monthly.	Project

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
		poor oversight to manage risks.	• Providing a summary of top risks based on their materiality to the project with severity and impact assessments. • Summarizing mitigation strategies and status. • Distinguishing current issues from risks.	
30 **Project Quantitative Risk Assessment** – There is no evidence that the QRA has been reviewed and updated consistently to confirm and document contingency requirements throughout the project lifecycle. There is also no evidence of a Cost Estimate Basis to support the QRA process completed on Headworks. The Risk Management Plan, while encompassing Contingency Fund Management, lacks a defined process for managing contingency drawdowns, leading to difficulties in tracking contingency in the documentation. The QRA methodology used to quantify Headworks risks and assess contingency requirements was a cost-based risk analysis. The methodology, however, does not assess schedule impact, and therefore understates the impact associated with the schedule and schedule delays. The Biosolids team is enhancing Risk Management compared to Headworks. The project has a risk register and plans to use third party software to assist in understanding contingency reserves and run Monte Carlo simulations for contingency validation.	**High**	Lack of visibility leads to poor risk management and inability to manage cost increases. Lack of cost estimate basis leading to poor QRA results.	Develop and use a QRA on all Projects to define contingency requirements: • Conduct a QRA on the updated risks for Headworks to assess the contingency required to complete the project and gain confidence regarding the forecast cost to complete. Ensure that the QRA is supported by a well-defined cost estimate basis document. • Develop a process to manage contingency drawdowns and actively manage contingency drawdowns. • Incorporate learnings from Headworks, including contract risk transfer, contingency and the need for quality cost basis documentation to support quantitative risk analysis. • Plan for QRA updates for the Biosolids and Nutrient Removal projects throughout the project lifecycle. • The QRA methodology for Biosolids and Nutrient removal should consider the integration of schedule risk analysis. • Leading practice for integrated cost and schedule risk analysis can be found within AACE 57R-09 “Integrated cost and schedule risks analysis using risk drivers and Monte Carlo simulation of a Critical Path Method (“CPM”) model.	Project
31 **Mechanism to Manage Emergency Costs –** There is lack of evidence of a Management Reserve or other mechanism to cover unanticipated risks outside of the scope of the project budget and defined project contingency. A common industry practice is to use a management reserve to cover high consequence, low probability events such as a pandemic or a force majeure that would be considered too improbable and expensive for the project to carry contingency. The NWI failure is an example of a risk that could be covered in this way rather than by consuming project contingency.	**High**	Lack of sufficient contingency and management reserve leads to increased financial risk and increased owner vulnerability.	Explore establishing a mechanism for the Biosolids and Nutrient Removal projects to fund unanticipated risks outside of the scope of the project’s budget and provide a financial buffer for the City related to large complex projects. The sort of risks that are normally covered by such a mechanism have very low probability with catastrophic consequences and are usually not carried in a project risk register.	Joint

Management Response	Person Responsible [Name, Title]	Implementation Plan Due Date [Date]
24 Management agrees with the recommendation. The Director, Assets and Project Management will complete this recommendation as part of the work to address Recommendation 1a.	See 1a	See 1a
25 Management agrees with the recommendation. The WSTP Program Leader will engage a third-party resource to write a Risk Management Plan that reflects the complexity of each of the main NEWPCC Upgrade projects. Timeline: * Engage third party consultant by December 2024 * Draft risk management plan to be complete by Q1 2025. * Final risk management plan incorporated into the project plans by Q2 2025	WSTP Program Leader	Q2 2025
26 Management agrees with the recommendation. See recommendation 22	See 22	See 22
27 Management agrees with the recommendation. See recommendation 14	See 14	See 14
28 Management agrees with this recommendation. Risk reporting for the Biosolids and Nutrient Removal contracts has yet to be negotiated and will consider audit recommendations as well as lessons learned from Headworks. The Headworks Design-Builder is meeting contractual obligations for risk reporting (including severity). Changes to risk reporting requirements will alter the contract and may result in additional costs. Timeline: * Additional risk reporting criteria to be added to the draft DBAs for Headworks and Nutrient Removal by end of Q2 2025	See Management Response	Q2 2025
29 Management agrees with the recommendation. See recommendation 8	See 8	See 8
30 Management agrees with the recommendation. See recommendations 22, 25, and 27	See 22, 25, and 27	See 22, 25, and 27

31 Management agrees with the intent of the recommendation but disagrees with the creation of designated Management Reserve. WWD manages risks using municipal utility standard best practices. The ten-year financial model provides for medium term financial stability and the ability to fund unforeseen emergency situations by retaining a target percentage of sales, an Environmental Projects Reserve that funds specific projects, and the ability to transfer between the four funds managed by WWD. An additional Management Reserve for this specific project would necessitate an increase to utility rates in order to accumulate funding.	See Management Response	See Management Response

Change Control Processes Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
32 **Change Control Process** - The project change control process outlined in the PMM is aligned with expected change processes on major projects. The process appears to be aligned to the change control process included in the Headworks DB Agreement. However, review and approval of changes are not occurring in a timely manner due to constraints with delegation of authority. See Observations #40 for recommendations as it relates to timely approval of changes and Observation #2 for delegation of authority.	**Medium**	Delays in reviewing and approving changes can cause project delays, cost overruns, and potential claims.	Address review and approval as part of Recommendations #2 and #40 regarding delegation of authority and the implications on the change control process.	Joint
33 **Change Log** - The change order log (excel) for the main DB agreement on Headworks adequately tracks the date, change in contract price, contract value and scope change number. Requests for Information ("RFIs") and Requests for Substitution ("RFSs") are tracked and assigned to responsible parties in Aconex. The change log is maintained by the project team and tracks change order ID, description of change, approval history, amount, milestone payment number and contract value after approval. However, the log does not include schedule impact of the change or clearly provide the date the change was initially submitted.	**Medium**	Missing elements of the change log may lead to ineffective change management	Include schedule impact and date of submittal in the change log. In addition to the monetary impact of the change order, it is leading practice to include a summary of the schedule implications of each change order (if any). Including a clear date of submittal allows for tracking of change approval timelines and helps facilitate active management of change order approval.	Project
34 **Project Change Reporting -** The monthly construction reports generated by RRS, the main DB contractor on Headworks, document the status and quantity of change orders. Such items are adequately documented with associated document number, date modified, revision number and status. However, a summary of all of these change orders, including both pending and approved and the delineation of their status, is not included in the Projects City reporting.	**Medium**	Absence of clear reporting changes resulting in poor oversight to manage risks.	Include a summary of pending and approved changes and their impact on cost and schedule in monthly project reports. Refer to Recommendation #8 regarding project reporting improvements.	Project

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
32 Management agrees with the recommendation. See recommendations 2 and 40	See 2 and 40	See 2 and 40
33 Management agrees with the recommendation. The WSTP Project Coordinator will update the Headworks Change Log to include this information from the Change Orders. Timeline: Update to be completed in October 2024.	WSTP Project Coordinator	Q12025
34 Management agrees with the recommendation. See recommendation 8	See 8	See 8

Cost and Schedule Management Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
35 **Project Controls Plan Update** - The Project Controls management plan was developed for the WSTP and outlines the purpose, scope, methodology and requirements to track and forecast cost and schedule based on the defined performance metrics. However, it is missing a section outlining the Project Controls reporting frequencies and meetings.	**Medium**	Missing elements of the controls plan may result in challenges reporting progress	Include or refer to a reporting calendar section in the Project Controls Plan that outlines required meetings, attendance, and frequencies for preparing Project Controls reports.	Project
36 **Cost and Schedule Performance Metrics -** The Project team is using the City required reporting templates and tools; however, these are not adequate for a project of this size and complexity. The main cost and schedule performance metrics included in the Project Controls dashboard are CPI and SPI. Given the milestone payment structure used for the main DB agreement on the Headworks project, CPI is not an effective metric for measuring cost performance. This is because CPI tends to lag and show values close to one for extended periods while earned value aligns closely with actual costs in this payment structure. Consequently, CPI becomes less indicative as a performance metric. It is more useful in time and material, progress, or unit rate-based payment structures. Solely	**High**	Relying solely on the CPI in a milestone payment structure can lead to a misleading perception of cost efficiency, potentially masking budget overruns.	Include additional cost and schedule performance metrics in the project dashboard. Examples of additional metrics might include to-complete performance index (“TCPI”), and Budget at Completion (“BAC”) or Estimate at Completion (“EAC”).	Project

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
reporting CPI performance can create a false impression that project costs are on budget. It was noted in interviews that Biosolids payment structure may be progress payments, and therefore CPI will be a more effective performance metric to report performance.				
37 **WBS Level Reporting –** There does not appear to be adequate tracking of cost and schedule performance at the WBS level. Productivities and quantity curves do not appear to exist, making it challenging to forecast cost and schedule. As a result, cost and schedule management is more reactive than proactive.	**High**	Lack of leading indicator reporting can lead to challenges in providing effective oversight, which can result in cost overruns, schedule delays, and a loss of stakeholder confidence.	Implement a more detailed tracking system at the WBS level. This could involve developing productivity and quantity curves to better forecast cost and schedule. By doing so, cost and schedule management can become more proactive rather than reactive, improving oversight effectiveness. Provide training for project team members on the updates made to cost and schedule performance tracking, including earned value principles, performance metrics, and how to implement.	Project
38 **Earned Value Management** – The Project Controls dashboard prepared monthly includes the S-curves for each unique project and the accompanying performance metrics to measure cost and schedule against baseline. The dashboard reports the earned value of the Headworks DB only, and there is no earned value of the owner indirect costs and other material WBS components of the project budget.	**High**	Lack of tracking indirect costs may lead to an incomplete understanding of the project overall cost and schedule performance.	Expand the scope of the earned value management ("EVM") system to include all material components of the project budget, not just the Headworks DB. This would involve tracking the earned value of owner indirect costs and other WBS components. By doing so, the Project Controls dashboard would provide a more comprehensive view of project performance against the baseline.	Project

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
35 Management agrees with this recommendation. This information is currently managed at the division level. This ensures division wide reporting requirements are monitored in one location and avoids duplication of work. A WSTP MCPE will reference the reporting calendar in the monthly project controls report for information. Timeline: February 2025	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2025

36 Management agrees with the recommendation. See recommendation 8.	See 8	See 8
37 Management agrees with the recommendation for non-milestone-based contracts (Biosolids and Nutrient Removal). Headworks is a milestone-based project, so tracking at a deeper WBS level is not possible without a major contract change. Additionally, as the timeline for complete implementation of this recommendation is Q2 2026, and Headworks will be almost complete by that time, there is little value for money to be gained with respect to the Headworks project. * Biosolids: This is currently underway with the Development Partner who is creating a Work Breakdown Structure for the development phase. Timeline: February 2025 * Nutrient Removal: A WBS will be developed for the procurement phase. Future phases will be developed as the project progresses. Timeline: * Nutrient Removal draft to be completed in January 2025 * Final: To align with project execution plan March 2025	See Management Response	Q1 2025
38 See recommendation 8 Management agrees with this recommendation. EVM is already being done for the Headworks project. As other major supplementary contracts come online, they will be included in the EVM. Timeline: * Currently ongoing for Headworks * Other supplementary contracts will be added following the first invoice	See 8	See 8

Contract Management and Administration Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
39 **Contract Management and Administration Plan & Contract Administration Resource** - A complete project specific contract management / administration plan does not exist and the Responsibilities Matrix, which includes details on responsibilities for aspects of person responsible for contract administration on the project, requires updates and enhancements. It is understood, through interviews, that the City's Project Manager is the contract administrator for the main DB agreement. The project team has developed a 'Process and Procedures for Managing the Design Build Contract' document to clarify certain processes instructed in the design build agreement. While the document identifies many of the key elements of an effective contract management/administration plan, it it does not reflect the complete view of contract administration including all project-specific processes, and the delineation of responsibilities on the project. Including, for example, the delineation of role and responsibilities between the City, Veolia, and the Owner's Advocate in contract compliance, submittals, and communications related to the technical requirements, along with project specific requirements and processes for contract change management, key contractor meetings, and formal correspondence.	**High**	Inadequate contract management may result in financial risk to the City.	39a) Develop a project specific contract management/administration plan that clearly defines roles and responsibilities, and project specific processes and requirements for key elements such as contract compliance monitoring, contract reporting, contract change management, meetings, and formal correspondence. The plan should at minimum address the specific requirements for the main project contract and may be written to reference the City of Winnipeg's PMM where elements of Section 9 in the manual are relevant and reflect the project's processes. The project team can also rely upon the 'Process and Procedure for Managing the Design Build Contract' when creating the full contract management/administration plan.	Project
			39b) Dedicate a resource to take over many of the contract and claims management and administration duties from the Project Manager. Accountability for contract and claims management may remain at the Project Manager level, however, day-to-day responsibility for administration is best delegated down so that the Project Manager's attention remains focused on achieving the overall project scope, cost, and schedule. It is understood that change order routing/administration has already been delegated to other resources.	Project
40 **Change Order Approval Timeline** - Contract change management follows the processes set out within the contract. On the Headworks Project, there is a delay in City review and approval of contract change orders exceeding the 10-day requirement stipulated within the DB agreement. There is evidence of change order approvals taking four months or longer in certain cases. Significant delays in change order approvals can limit the contractor's ability to progress with required work and/or to formalize cost and schedule impacts. Delays in approvals beyond the contractual requirements also provides grounds for potential future claims from the contractor. It is understood that delegated authority to allow for timely change control has been previously requested for the Power Supply and Headworks Project. Some delegation of authority was approved, however, the approval only delegated from Council to the CAO,	**Medium**	Prolonged duration to approve change orders may result in delays to the project and potential claims.	Take steps to expedite the change order review and approval timelines. The primary means to achieve this is through changes in the delegation of authority and/or escalation as required through escalation protocols. Refer to Recommendation #2 regarding delegation of authority for the project and Recommendation #3 regarding escalation protocols. Note that this recommendation is intended to cover contract change order approvals only, not initial contract approvals. The Project team can also implement an expedited approval pathway for urgent changes where fast approval is required to control risk to the City. This would not include typical situations that would be covered by the delegation of authority and should be reserved for high dollar value high risk changes. Criteria for use of the expedited approval pathway should be developed and could include examples such as events comparable to the NWI failure,	Joint

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
not down to the Project level. Timely decisions may reduce schedule and cost risk.			force majeure, safety critical, security critical, or operational critical items.	
41 **Contract Compliance** - A project specific plan for contract compliance for the main DB agreement on the Headworks Project does not exist. It is understood that the list of deliverables in the contract is used for typical contract compliance activities on this project, however, it does not outline how compliance with those requirements is monitored and delineation of responsibilities.	**High**	Lack of clarity regarding the specific responsibilities and requirements of the contract may result in miscommunications, potentially resulting in non-compliance with the contract terms.	Identify and document project and contract specific contract compliance activities and responsibilities. These may be incorporated as part of the project specific contract management/administration plan.	Project

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
39a & b Management agrees with the recommendation. The WSTP Program Leader will be responsible for developing and maintaining the contract management plan for each project. Headworks: Develop a project specific contract management plan that defines various activities, such as: contract administration; team roles and responsibilities; schedule management; risk management; claims management; performance management; cost management; contract close-out plan; governance structure; stage gates; quality management; communication; health, safety and environment; lessons learned; submittal process; Owner's Advocate oversight; operational documents; warranty, etc. Biosolids & Nutrient Removal: Develop project specific contract management plans that define similar activities to those listed for Headworks. The plans will initially be written for the development phase and later updated during the design build phase. Timeline: * Hire third-party Contract Management Plan Consultant: Jan 2025 * Headworks: completed by April 2025 * Biosolids development phase: draft in May 2025; final by Q2 2025 * Biosolids design build phase: draft in Q1 2026; final by Q2 2026 * Nutrient Removal development phase: draft in Q1 2026; final by Q2 2026 * Nutrient Removal design build phase: draft in Q3 2026; final by Q4 2026	WSTP Program Leader	Headworks: Q2 2025 Biosolids development phase: Q2 2025 Biosolids design build phase: Q2 2026 Nutrient Removal development phase: Q2 2026 Nutrient Removal design build phase: Q4 2026

40 Management agrees with the recommendation. See recommendation 2 for Over-Expenditure Approval as this requires Council Approval. For approval of Change Orders, a WSTP MCPE will prepare a memo to the Manager of Purchasing, who will forward to the CFO recommending the following delegation of authority to Appendix 10 of FM002: For Major Capital Projects that have a governance body created specifically in the contract, and that governance structure within the contract has been approved by the Chief Financial Officer, that the most senior City representative represented at the highest level of the governance body structure be delegated the authority to approve amendments to terms of a contract, in consultation with Legal Services, on the condition that the funding for the amendment is available within the applicable capital budget as approved by Council. Timeline: The delegation of authority memo was submitted by the WSTP MCPE to the Manager of Purchasing on November 8, 2024. The Manager of Purchasing will forward to the CFO in Q4 of 2024.	Winnipeg Sewage Treatment Program Major Capital Project Engineer and Manager of Purchasing	Q4 2024
41 Management agrees with this recommendation. Compliance with the Headworks DBA is monitored by the Owner's Advocate throughout the project. Project compliance is also verified on an on-going basis for the Headworks project by a third-party Independent Certifier. Milestone certificates (and related payment) are not issued until compliance with the Headworks DBA is confirmed by the Independent Certifier. Timeline: * Headworks DBA Contract Compliance Plan: Q2 2025 * Biosolids DBA Contract Compliance Plan: Q2 2026 * Nutrient Removal DBA Contract Compliance Plan: Q2 2026	See Management Response	Q2 2026

Claims Management and Claims Avoidance Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
42 **Claims Management and Avoidance Plan** - A project specific claims management plan and claims avoidance strategy does not exist. It is understood that the Claims Management section of the City's PMM is followed for this project. While the PMM identifies many elements of effective claims avoidance and claims management it does not reflect the specifics of this project and does not clearly identify the roles and responsibilities for claims management including for overall claims administration and claims analysis.	**High**	Inadequate claims management may result in increased exposure to claims risk to the City.	Develop a project specific claims management plan and claims avoidance strategy that clearly defines roles and responsibilities, and project specific processes and requirements for key elements such as claims administration and claims analysis.	Project

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
It is understood that the City has taken steps to improve claims avoidance on the Headworks Project by establishing regular communication with the contractor at the Project Management and Executive levels to discuss potential issues. This is in alignment with the claims mitigation section of the PMM. It is the perception from project stakeholders that by proceeding with a PDB for the Biosolids Project that the City is reducing its claims exposure. Despite undertaking the project under a collaborative model, there is still a risk of claims, and a claims management plan should be in place.				

Management Response	Person Responsible [Name, Title]	Implementation Plan Due Date [Date]
42 Management agrees with the recommendation. See recommendation 14 as well. The WSTP Contracts Leader will engage a third- party resource to write a Claims Management Plan for the NEWPCC Upgrade projects. Timeline: * Engage third party consultant by Q1 2025 * Draft claims management plan to be complete by Q2 2025. * Final claims management plan incorporated into the project plans by Q3 2025	WSTP Contracts	Engage third party consultant by Q1 2025 Draft claims management plan to be complete by Q2 2025. Final claims management plan incorporated into the project plans by Q3 2025

4.5 Approvals & Social License

This pillar was not included as part of the base scope of this audit and a detailed review of this area was not conducted. However, a few observations and recommendations were identified during the review and have been summarized for consideration below.

Positive observations:

- **Indigenous liaison:** The Project team hired an Indigenous liaison to help with communication on the Projects.

Approvals and Social License Detailed Findings and Recommendations:

Findings/Observations/Conclusions	Rating	Consequence	Recommendations	Responsibility
43 **Project Public Communication** - The size and purpose of the Projects results in a level of press, interest, and public scrutiny that requires a comprehensive strategy, management plan, and dedicated resources. An up-to-date plan for public communication is not currently in place for the Project.	**High**	Lack of capacity to manage public communication may result in negative public perception and lack of confidence in the City.	Develop a strategy and plan for managing the public profile of the Projects and allocate resources to support coordination and alignment with City-wide activities. Consider reassessing the public communication approach and engaging specialist resources, reporting to the Project Director, to support in messaging and media.	Project
44 **Social Procurement and Communication with Indigenous Communities-** City Council has given specific directives to the Biosolids project that are outside of the corporate strategy for social procurement. Social procurement and communication with Indigenous Communities have long term implications for the City of Winnipeg. Currently, these activities are being done specific to the Projects without connection to a City of Winnipeg overall strategy. A City-wide approach to communication with Indigenous Communities that considers major projects is not currently in place.	**Medium**	An inconsistent approach or loss of relationships established by the project may result in lack of confidence in the City.	44a) Develop a comprehensive City-wide approach to communication with Indigenous Communities including for major projects such as the Projects. Dedicate resources, reporting to the Project Director, to support with the implementation on the Projects.	Joint
	Medium	Inadequate planning and resourcing may result in failure to achieve the objective.	44b) Continue as planned to develop the social procurement plan and incorporate into the project planning documentation. .	Project

Management Response	Person Responsible [Title]	Implementation Plan Due Date [Date]
43 Management agrees with the recommendation. See recommendation 14 as well. WSTP MCPE will work with Departmental and Corporate Communications to develop a term of reference to engage a third-party communications consultant. The external consultant will develop the communication strategy and management plan. Timeline: * Post RFP: Q1 2025 * Award Contract: Q2 2025 * Draft communications management plan: December 2025	Winnipeg Sewage Treatment Program Major Capital Project Engineer	Q1 2026

* Final communications plan: Q1 2026		
44a Management agrees with the recommendation. An Indigenous Liaison has been retained for the NEWPCC Upgrades in February 2024. A draft Indigenous Communities communication plan was developed in the summer of 2024 and is currently under review. Discussions will be ongoing with Indigenous communities through the Biosolids Development Phase. Timeline: * Ongoing discussions with Indigenous communities from Nov 2024 to Dec 2025 * Final communications plan: Q1 2026 The Director of Assets and Project Management will apply lessons learned from the NEWPCC Upgrade Indigenous Communities communication plan, to other Major Capital Projects. The Project Management Manual will be changed to incorporate Indigenous Communities Communication Guidance by Q4 2026. Timeline: * Update Project Management Manual with Indigenous Communities Communication Guidance: Q4 2026	See Management Response	Q4 2026
44b Management agrees with the recommendation. Social procurement plan is being developed for Biosolids during the development phase. Biosolids: The social procurement requirements are being negotiated with the Development Partner. The social procurement plan outlining objectives and resources are being developed with the Development Partner. Timeline: * Begin negotiations: Q1 2025 * Finalize social procurement objectives: Prior to DBA for Biosolids (approx. Q2 2026) Nutrient Removal: Develop high level objectives in the project charter and project plan that will be included in contract documents. Use lessons learned from Biosolids. Timeline: *Create high level social procurement objectives: Q1 2025	See Management Response	Q2 2026

A Appendix: Methodology

KPMG employed a collaborative four phase approach to conduct the project review. The methodology incorporated the International Standards for the Professional Practice of Internal Auditing (IIA standards) and was delivered in accordance with the guidance provided in the Institute of Internal Auditor's International Professional Practices Framework (IPPF). It involved working with stakeholders from the City of Winnipeg team and Veolia to inform the observations and meet the objectives of the review. The four phases are described below.



- **Data Gathering and Analysis**

Following the kick-off meeting, a request for relevant project documentation and subsequent review occurred. The documentation requested and provided were used to develop a Project understanding and to commence the in-scope review aspects on the Project. The list of information and documents reviewed by KPMG are listed in Appendix E.

- **Interviews and Assessment**

Interviews were conducted with twelve individuals who had project responsibilities or involvement and were able to contribute knowledge of the Project. The interview provided clarity on the key Project stakeholders and participants and their project roles and responsibilities. In addition, interviews were used to further clarify, understand, and assess how the project developed from inception to present. The interviewees engaged were provided with the opportunity to share their own opinions, which resulted in the self-identification of risks, opportunities, and future improvement recommendations. The list of interviewed positions can be found in Appendix D.

- **Documentation and Reporting**

Concurrent with the document review and interviews, KPMG conducted assessment and validation of observations and identified improvement considerations. These activities supported the findings and considerations in this report.

- **Final Report and Presentation**

The report was finalized following a review by City of Winnipeg personnel to confirm the observations and context in the final report and the accompanying final presentation.

B Appendix: Priority Ratings

Each recommendation has been assigned a priority to indicate relative risk, potential impact and action required. In some cases, the implementation of a resolution may need to be staged, take longer than the timeframes listed below, and require budget and resources. Where this is the case, it will need to be stated in the management response. The priorities identified for the recommendations are based on the following standard impact statements:

Urgent

The issue represents a financial or reputational risk to the City and / or project and immediate action is required with a plan for timely resolution in place.

High Priority

Issue represents a control weakness, which could have or is having major adverse effect on the ability to achieve objectives.

- Recommendation must be given high priority to be initiated by management within an immediate timeframe (typically within 0-3 months) and up to 12 months to resolve.
- Project objectives are at risk of not being achieved.
- Proposed action plan and strategies to be developed as soon as possible to mitigate the associated risk, including financial loss, loss of reputation, and/or other operational impacts to the organization.

Medium Priority

Issue represents a control weakness, which could have or is having adverse effect on the ability to achieve objectives.

- Recommendation requires management action within a reasonable timeframe, typically initiated within 0-6 months with up to 18 months to resolve.
- Project objectives may still be achieved, but not effectively or efficiently.
- Proposed action plan and strategies are necessary to mitigate the possibility of financial losses, safety incidents, reputational damage loss of reputation, and / or operational impact to the organization.

Low Priority

The issue represents a minor control weakness, with minimal but reportable impact on the ability to achieve objectives.

- Recommendation requires action to be completed within a timeframe (typically >12 months) that does not interrupt operations.
- Project objectives can be achieved more efficiently and / or effectively.
- Proposed action is designed to improve the affected process.

C Appendix: Ease of Implementation

Each recommendation has been assigned an ease of implementation rating. The ease of implementation rating identified for the recommendations are based on the following standard statements:

Difficult

- Involves complex processes, requires governance approval to implement, or necessitates substantial changes to existing systems or practices.

Moderate

- Requires some changes to existing systems or practices but these changes are manageable and can be implemented within the current project team delegation of authority.

Easy

- Requires minimal resources, time, and effort, and involves straightforward processes. These recommendations are likely to be accepted by stakeholders.

D Appendix: Roles Contacted During the Audit

Title	Interview Date
Project Director	July 7th and 24th, 2024
Program Leader	July 9th, 2024
Headworks Project Manager	July 10th, 2024
Project Coordinator	July 11th, 2024
Contracts Leader	July 12th, 2024
Biosolids Project Manager	July 12th, 2024
Deputy Chief Administrative Officer	July 15th, 2024
Controls Manager	July 16th, 2024
Finance	July 16th, 2024
Director Assets and Projects Management	July 17th, 2024
Manager of Engineering	July 23rd, 2024
Director of Water and Waste	July 25th, 2024

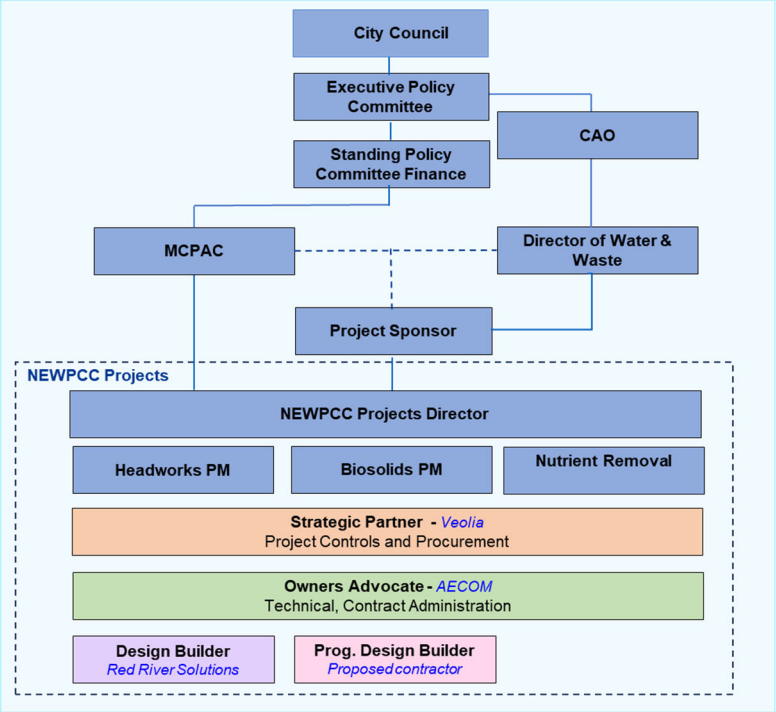
E Appendix: Documents Reviewed

No.	Document Name
1.	DOA to approve selection of Headworks preferred proponent
2.	City of Winnipeg Project Management Manual
3.	NEWPCC Upgrade Project Charter
4.	Headworks Facilities Project Charter
5.	Delegation of Authority Chart Overview
6.	Headworks and Biosolids Responsibility Matrices
7.	Biosolids Project Charter
8.	NEWPCC Upgrade Project Plan
9.	Biosolids Project Delivery Plan
10.	NEWPCC Upgrade Plan Upgrade Report
11.	Administrative Standard for Asset Management (FM-004)
12.	Financial Status Reports
13.	WSTP Project Controls Reports, including Schedule Reports
14.	Management Update Reports
15.	Project Progress Reports
16.	AECOM Daily Reports
17.	Over Expenditure Reports
18.	WSTP Master Controls Report Management Plan
19.	Administrative Standard No. IS-001 – Governance Structure – Internal Service
20.	WSTP Governance Structure Org Chart for City/Veolia Governance Roles
21.	NEWPCC Project Team – 2024
22.	NEWPCC Major Capital Upgrades Resourcing Plan
23.	Biosolids Resource Management Plan
24.	Biosolids DPA Org Chart
25.	Headworks Facilities Project Charter – Key Stakeholders Extract
26.	WSTP Communications Plan
27.	Meeting Minutes, NEWPCC Stakeholder Group Meeting (S-972, S1146)
28.	AECOM Project Execution Plan
29.	AECOM Consultant Services Management Plan
30.	Project Risk Management Approach
31.	Use of the Project Risk Register Document
32.	Headworks Project Risk Registers, including RRS
33.	Risk Rating Document
34.	Headworks Risk Management Plan
35.	Headworks Contingency Development Risk Registers

No.	Document Name
36.	Biosolids Risk Matrix
37.	Biosolids Risk Register
38.	Biosolids Risk Analysis, including contingency allocation
39.	WSTP Master Schedule Management Plan
40.	Headworks Contract Change Log
41.	Headworks Change Log - Aconex
42.	Headworks RFI Log – Aconex
43.	Headworks RFS Log – Aconex
44.	AECOM RFI RFS Change Orders Log
45.	RRS Monthly Logs
46.	Headworks Commercial Call Meeting Minutes
47.	Headworks Monthly Construction Report
48.	Process Control Management Plan
49.	RRS Document Management Plan
50.	Project Team Capital Delivery Strategy
51.	Claims Management Process
52.	RRS Design Build Agreement
53.	AECOM Agreement
54.	NEWPCC Procurement Strategy
55.	NEWPCC Upgrade Procurement Packaging Technical Memorandum
56.	Council Minutes, various, including decision to split NEWPCC into three projects, delivery model decisions, etc.
57.	AECOM WSTP Process and Procedures for Managing the Design Build Contract
58.	Biosolids Evaluation Frameworks
59.	Biosolids Delivery Model Analysis
60.	Biosolids Market Sounding
61.	Biosolids Procurement Review Memo
62.	Biosolids Procurement Strategy
63.	Headworks Correspondence Log
64.	RRS Project Management Plan

F Appendix: Governance Structure and Criteria

The figures below depict the current governance structure for the Projects and a summary of project governance requirements. The figure is not intended to serve as an organization chart.



Reporting relationships:
All contractors, Veolia, AECOM and Red River Solutions report to the City Project Director/Manager

Legend

- City of Winnipeg Team
- Veolia Team
- AECOM Team
- RRS Team
- TBD

The Five Rights of Project Governance

The ***right information***…to support the ***right decisions***…being made by the ***right people***…at the ***right time***…to achieve the ***right outcomes***.

An extension of Organizational Governance, Project Governance is the formal system of rules and procedures coupled with the right behaviors that establish **sound management, efficient delivery and effective oversight** of major capital projects.

Project Governance **aligns the management of projects to organizational objectives**, defines and regulates responsibility, authority and decision making, and provides the mechanism to effectively monitor and control performance and risk.

Alignment

- Ongoing alignment between corporate objectives and direction, project objectives and successful outcomes
- Alignment of culture, policies and objectives across project stakeholders
- Mechanisms in place to efficiently surface and respond to misalignment

Accountability

- Clearly defined, unambiguous and agreed accountability
- Clarity across functions and individuals for defining project objectives

Autonomy

- Is assigned to empower and facilitate effective decision-making
- Is aligned to accountability and capability
- Empowers effective, timely decision making

Disclosure

- A defined system for monitoring the project
- Reporting of information is transparent, timely and appropriate

G Appendix: Glossary

Acronyms and commonly used terminology:

AACE	Association for the Advancement of Cost Engineering
BAC	Budget at Completion
CAO	Chief Administrative Officer
CPI	Cost Performance Index
CPM	Critical Path Method
DB	Design-Build
DBB	Design-Bid-Build
DBF	Design-Build-Finance
EAC	Estimate at Completion
EVM	Earned Value Management
FSR	Financial Status Report
HSSE	Health, Safety, Security and Environmental
ICIP	Investing in Canada Infrastructure Program
KPI	Key Performance Indicators
MCPAC	Major Capital Project Advisory Committee
MCPD	Major Capital Project Directives
NEWPCC	North End Sewage Treatment Plant, otherwise known as the North End Water Pollution Control Centre
NWI	Northwest Interceptor
PDB	Progressive Design-Build
PMI	Project Management Institute
PMM	Project Management Manual
Project Controls	Tools, techniques, and processes used to aid project managers measure and control project constraints including cost, schedule, scope, quality, risk, and resources.
RACI	Responsible, Accountable, Consulted, and Informed
RBS	Risk Breakdown Structure
RFI	Request for Information
RFS	Request for Substitution
QRA	Quantitative Risk Assessment
SEWPCC	South End Sewage Treatment Plant, otherwise known as the South End Water Pollution Control Centre
SPC	Standing Policy Committee

SPI	Schedule Performance Index
SRA	Schedule Risk Analysis
Stage gate	“A decision point during any stage of the asset’s lifecycle”. As defined in the City’s PMM.
TCPI	To-Complete Performance Index
Veolia	Veolia North America
WBS	Work Breakdown Structure
WSTP	Winnipeg Sewage Treatment Program
WWD	Water and Waste Department



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