SCHEDULE 18

TECHNICAL REQUIREMENTS

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SCHEDULE 18

TECHNICAL REQUIREMENTS

1 INTRODUCTION AND DEFINITIONS

1.1 INTRODUCTION

This Schedule 18 sets out the general technical requirements applicable to the design, construction, operation, maintenance and handback of the wastewater treatment plant upgrade in Regina, Saskatchewan.

The information in this Schedule 18 is organized as follows:

Section 1 – Introduction and Definitions

Section 2 – Project Co's Management Systems and Plans

Section 3 – Works Requirements

Section 4 – Existing Facilities O&M Requirements

Section 5 – O&M Requirements

Section 6 – Handback Requirements

References to section numbers are to section numbers of this Schedule 18 unless noted otherwise.

1.2 DEFINITIONS

In this Schedule 18, in addition to the definitions set out in Section 1.1 of the Agreement, the following expressions have the following meanings (and, where applicable, their plurals have corresponding meanings):

"**1/500 Year Flood Elevation**" means a water elevation of 565.2 metres as measured from the City geodetic survey benchmark;

"**30-Day Performance Test**" means the demonstration and testing of the Infrastructure to successfully meet the Works Requirements for a minimum of 30 consecutive days as described in Section 3.10.1;

"**Accredited Laboratory**" means a laboratory which meets the requirements of the Standards Council of Canada, National Standards System, General Requirements for the Competence of Testing and Calibration Laboratories, CAN-P-4E (ISO/IEC17025) and Requirements for the Accreditation of Environmental Testing laboratories (CAN-P-1585);

"**ACI**" means American Concrete Institute;

"**Actual Annual Power Consumption**" is the annual amount of power consumed at the Infrastructure as specified in the Annual O&M Report;

"**Allowable Use**" has the meaning indicated in Section 3.4.6;

"**Annual Asset Management Report**" has the meaning indicated in Section 5.7.7;

"**Annual Dependability Test**" means the annual testing to demonstrate that the Infrastructure can deliver the Design Capacity evidenced by repeating the Hydraulic Capacity Tests in accordance with the procedure set out in the Commissioning and Startup Plan, or an alternate procedure agreed to in advance and in writing by the City;

"**Annual O&M Report**" has the meaning indicated in Section 5.6.13;

"**Annual Quality Management System Report**" has the meaning indicated in Section 2.2.5;

"**ANSI**" means American National Standards Institute;

"**APEGS**" means the Association of Professional Engineers and Geoscientists of Saskatchewan;

"**Approved Planned Maintenance**" has the meaning indicated in Section 5.7.9;

"**Architect**" means an individual who holds a certificate of registration to engage in the practice of architecture under *The Architects Act* (Saskatchewan);

"**As-Built Drawings**" has the meaning indicated in Section 3.9.4.1;

"**Asset Management Plan**" has the meaning indicated in Section 2.7.10;

"**ASTM**" means American Society for Testing and Materials;

"**Available Capacity**" means the capacity of the Infrastructure that is available to treat, store and convey Treated Wastewater at any given time;

"**AWWA**" means American Water Works Association;

"**Beneficially Reused Biosolids**" means Biosolids processed by the Infrastructure that are beneficially reused on the Lands in accordance with Technical Requirements;

"**Biosolids**" means organic residuals produced on the Lands and processed by the Infrastructure that meet all the biosolids criteria stipulated in Section 3.4.4;

"**Biosolids and Existing Lagoons Management Plan**" has the meaning indicated in Section 2.7.8;

"**BMS**" means the Building Management System;

"**BOD_5**" means the biochemical oxygen demand expressed as milligrams per litre measured at 20°C over a five day period;

"**Bypass**" means the diversion of waste flows from any part of the Infrastructure in a manner not approved by any applicable Governmental Authority;

"**CEC**" means Canadian Electrical Code (Saskatchewan Amendments);

"**CISC**" means Canadian Institute of Steel Construction;

"**City Construction Representative**" has the meaning indicated in Section 3.8.2;

"**City Existing Facilities O&M Representative**" has the meaning indicated in Section 4.2;

"**City O&M Representative**" has the meaning indicated in Section 5.3;

"**Class B**" means Biosolids classification as defined in the United States Environmental Protection Agency – Part 503 Standards for the Use or Disposal of Sewage Sludge;

"**CMMS**" or "**Computerized Maintenance Management System**" means the hardware solution and software system that is used to plan, organize and keep records of the maintenance of the equipment and facilities comprising the Infrastructure;

"**Commissioning and Startup Plan**" has the meaning indicated in Section 2.6.4;

"**Condie Road Valve Chamber**" means the existing valve chamber located on the west side of Condie Road in the North East Quarter of Section 30, Township 17, Range 20, West of the 2nd Meridian and, for greater certainty, includes the surrounding area up to the limit of contract described in Figure 2 of Appendix A - Existing Facilities Drawings attached to Schedule 7 (Existing Facilities);

"**Construction Management Plan**" has the meaning indicated in Section 2.6.2;

"**Construction Occupational Health and Safety Plan**" has the meaning indicated in Section 2.6.3;

"**Construction Period Interface Plan**" has the meaning indicated in Section 2.6.6;

"**Construction Period Plans**" means Project Co's Management Systems and Plans for the Construction Period as set out in Section 2.6;

"**Construction Period Public Communication Plan**" has the meaning indicated in Section 2.6.5;

"**Continuous Sound**" means any Sound Level that occurs for a duration of more than 3 minutes or occurs sporadically for a total of more than 3 minutes in any continuous 15 minute time period;

"**CSA**" means the Canadian Standards Association;

"**CSDMA**" means the Canadian Steel Door Manufacturers' Association;

"**Declared Capacity**" means the Available Capacity of the Infrastructure declared by Project Co in its Operating Period Payment Calculation and Annual Dependability Tests;

"**Demolition and Decommissioning Plan**" has the meaning indicated in Section 2.6.7;

"**Design Capacity**" means the capacity that the Infrastructure must be designed and constructed to achieve as defined in Tables 3.4.2.A, 3.4.2.B, 3.4.4, respectively;

"**Design Plan**" has the meaning indicated in Section 2.6.1;

"**Digested Sludge**" means process solids consisting of any combination of primary solids, secondary solids or tertiary solids that have undergone stabilization;

"**Dewatered Sludge Cake**" means Digested Sludge, Inorganic Sludge or Biosolids that have been dewatered to a minimum final moisture content of 21% on a monthly arithmetic mean and a minimum of 18% for any daily sample;

"**Dewatered Sludge Cake Storage Area**" means those lands and facilities located on the North West Quarter of Section 30, Township 17, Range 20, West of the 2nd Meridian and as shown on the drawing forming part of Appendix A - Existing Facilities Drawings attached to Schedule 7 (Existing Facilities);

"**D/T**" or "**Dilutions to Threshold**" means a method or technique that determines the number of non-odorous air dilutions required to dilute an air sample and identifies the concentration at which 50 percent of a human panel can identify the presence of an odour or odourant without characterizing the stimulus;

"**Effluent Reuse Pumping Station**" means a facility constructed for the pumping and conveyance of Treated Wastewater to End-Users;

"**EEMAC**" means the Electrical Equipment Manufacturers Association of Canada;

"**EMPA**" or "**Environmental Management and Protection Act**" means the *The Environmental Management and Protection Act* (Saskatchewan);

"**Emergency Response Plan**" has the meaning indicated in Section 2.7.2;

"**End-Users**" means the City and any persons, residences, businesses, lessees, operators or institutions whose sewer systems are connected to the Existing Facilities or Infrastructure or who are supplied with Raw Wastewater or Treated Wastewater;

"**Environmental Management System**" has the meaning indicated in Section 2.3;

"**Existing Facilities Occupational Health and Safety Plan**" has the meaning indicated in Section 2.5.3;

"**Existing Hauled Waste Receiving Station**" means the existing Hauled Waste receiving station located in the South West corner of Lagoon 4.

"**Existing Lagoons**" means the earthen basins and surrounding system of berms and associated clay liners wholly contained within the Lands that are used for the treatment of Primary Effluent, Raw Wastewater, Hauled Waste, Hydrovac Waste and the storage of Biosolids, Digested Sludge, Wet Weather Flows and Inorganic Sludge as described in Table 3.4.6;

"**Field Calibrator**" means an instrument used for the calibration of a Sound Level Meter and approved by the manufacturer for use with such Sounds Level Meter, certified and calibrated by the manufacturer within the 12 months prior to its use;

"**Final Discharge Point**" means the point, other than an overflow point, of a wastewater system beyond which its owner or operator no longer exercises control over the quality of the wastewater before it is deposited as effluent in water or a place, as defined in the Wastewater Systems Effluent Regulations made under the *Fisheries Act* (Canada);

"**Flow Diversion Chamber**" means the components of the Infrastructure constructed for the conveyance and diversion of Treated Wastewater to an Effluent Reuse Pumping Station at rate that exceeds the hydraulic capacity of the Effluent Reuse Pumping Station;

"**Flow Meter**" means a metering device that measures, calculates and records flow as described in Section 3.5.3.1;

"**Full Treatment**" means the treatment of the design flows through the preliminary, primary, secondary and disinfection processes to the design criteria listed in Table 3.4.2B;

"**Full Treatment Flows**" means the flows in the design criteria in Table 3.4.2B;

"**GTH**" means Global Transportation Hub;

"**GTH Valve Chamber**" means the valve chamber for the dual forcemains from the GTH located south of the Condie Road Valve Chamber;

"**Hauled Waste**" means wastewater, septage and industrial waste that is removed from a cesspool, septic tank system, privy vault or privy pit, chemical toilet, portable toilet, sewage holding tank or any other facility and transported for discharge;

"**Health and Safety Management Plan**" has the meaning indicated in Section 2.4.1;

"**HMI**" means the industrial computer work station and portable personal display units which allow viewing of the various process area real-time graphics, alarms, changing of process parameters and modes and other operator control actions;

"**HVAC**" means heating, ventilation and air conditioning;

"**Hydraulic Capacity Tests**" means the testing of the Infrastructure to demonstrate that it can successfully treat, store and convey to the Design Capacity;

"**Hydraulic Institute**" is a nonprofit industry trade organization related to the engineering, manufacture, standards development and application of pumping equipment;

"**Hydrovac Waste**" means waste generated by hydraulic excavations and transported for discharge;

"**ICEA**" means Insulated Cable Engineers Association;

"**IEEE**" means Institute of Electrical and Electronics Engineers;

"**Incident Logging Centre**" means the telephone contact line and database tracking system provided by Project Co for the purposes of providing a single point of contact for receiving and recording all incidents and events related to the performance of the Existing Facilities O&M and the O&M as they pertain to the End-Users, as described in Section 5.6.16;

"**Incident Logging Centre Plan**" has the meaning indicated in Section 2.4.5;

"**Independent Reviewer**" has the meaning indicated in Section 2.2.4.2;

"**Infrastructure Diversion Chamber**" means the components of the Infrastructure constructed for the conveyance and diversion of Raw Wastewater to the Infrastructure and Existing Facilities as described in Section 3.7.3.14;

"**I/O**" means input/output;

"**Inorganic Sludge**" means process solids generated from the tertiary clarifiers which have not undergone stabilization and contain inorganic based chemical additives;

"**ISA**" means International Society of Automation;

"**Leq**" means the equivalent continuous Sound Level over the periods of time specified in Table 3.7.3.20 at the boundary of the Lands as measured by a Sound Level Meter;

"**Level Monitor**" means a level measurement instrument that measures, calculates and records liquid level as described in Section 4.5.4;

"**Liquid Stream Treatment**" means unit processes for the treatment of the liquid portion of the Raw Wastewater, where Treated Wastewater is the end product;

"**Liquid Stream Treatment Performance Test**" means the demonstration and testing of the Infrastructure as described in Section 3.9.1.5;

"**Major Incidents**" means any event or incident which presents a threat to public health or the environment, including any environmental pollution event or incident or any event or incident which is required by Applicable Law, Standards and Guidelines or Permits and Approvals to be reported to any Governmental Authority;

"**MCC**" means Motor Control Centre;

"**Monthly Incident Logging Centre Report**" has the meaning indicated in Section 5.6.16.3;

"**MPI**" means the Master Painters Institute;

"**NBCC**" means the National Building Code of Canada;

"**NEMA**" means the National Electrical Manufacturers Association;

"**NFPA**" means the National Fire Protection Association;

"**Noise Control Plan**" has the meaning indicated in Section 2.7.5;

"**Non-Continuous Sound**" means any Sound Level that is not a Continuous Sound measured with a Sound Level Meter;

"**NSF**" means NSF International, a global public health and safety organization;

"**O&M Manuals**" means the manuals prepared by Project Co for the Infrastructure containing detailed operating and maintenance procedures and other specific instructions, policies, directives, routines, schedules and other matters related to the O&M, as is more particularly described in Section 3.9.4.2;

"**O&M Occupational Health and Safety Plan**" has the meaning indicated in Section 2.7.3;

"**O&M Plan for Existing Facilities**" has the meaning indicated in Section 2.5.2;

"**Odour Complaint**" means a single odour-related complaint received by the City from an independent member of the public;

"**Odour Criteria**" has the meaning indicated in Section 3.4.5;

"**Odour Incident**" has the meaning indicated in Section 5.6.2;

"**Odour Management Plan**" has the meaning indicated in Section 2.7.4;

"**Odour System Performance Test**" means the testing to demonstrate that the Infrastructure successfully meets the Odour Criteria, as described in Section 3.9.1.6;

"**Odour Verification Program**" has the meaning indicated in Section 5.6.7.1;

"**Odour Verification Report**" has the meaning indicated in Section 5.6.7.2;

"**Operating Period Plans**" means Project Co's Management Systems and Plans for the Operating Period as set out in Section 2.7;

"**Operation and Maintenance Plan**" has the meaning indicated in Section 2.7.1;

"**Operations Interface Plan**" has the meaning indicated in Section 2.4.2;

"**Overflow Point**" means a point of a wastewater system via which excess wastewater may be deposited in water or a place and beyond which its owner or operator no longer exercises control over the quality of wastewater before it is deposited as effluent, as defined in the Wastewater Systems Effluent Regulations made under the *Fisheries Act* (Canada);

"**PCP**" means process control panels;

"**PCS**" or "**Plant Control System**" means a HMI/PLC based data acquisition and control system that performs the plant-wide functions of data acquisition, distributed control and operator interface and will consist of HMI servers and workstations and PLCs connected by ethernet and wireless communications;

"**Performance Failure**" means a failure in the functional performance of the Infrastructure or the Existing Facilities to fulfill the Technical Requirements resulting in a failure, interruption, reduction or degradation of the service delivered to the End-Users;

"**Permitting and Approval Plan**" has the meaning indicated in Section 2.4.4;

"**PLC**" or "**Programmable Logic Controller**" means digital systems that perform digital and analog control in a stand-alone or shared control system;

"**Pressure Meter**" means a metering device that measures, calculates and records pressure, as described in Section 3.5.3.2;

"**Primary Effluent**" means partially treated Raw Wastewater that has undergone primary wastewater treatment processes, including physical separation and clarification processes measured from the exit of the primary clarifiers;

"**Professional Engineer**" means an individual who holds a certificate of registration to engage in the practice of engineering under *The Engineering, Geoscience Professions Act* (Saskatchewan);

"**Proposed Planned Maintenance**" has the meaning indicated in Section 5.7.9;

"**Project Co Construction Representative**" has the meaning indicated in Section 3.8.2;

"**Project Co Architect of Record**" means the Architect that is employed or retained by Project Co and who has stamped and signed drawings for the Works;

"**Project Co Engineer of Record**" means the Professional Engineer that is employed or retained by Project Co and who has stamped and signed drawings for the Works;

"**Project Co Existing Facilities O&M Representative**" has the meaning indicated in Section 4.2;

"**Project Co O&M Representative**" has the meaning indicated in Section 5.3;

"**QA/QC**" has the meaning indicated in Section 5.6.5;

"**Quality Management System**" has the meaning indicated in Section 2.2;

"**Quality Monitor**" means the online and standalone wastewater quality monitoring devices, instrumentation, controls or equipment used for continuous or periodic monitoring of the wastewater quality parameters at any point in the Infrastructure or the Existing Facilities;

"**Raw Wastewater**" means wastewater delivered to the Infrastructure or the Existing Facilities from the City and End-Users which has not undergone any prior treatment and, for greater certainty, does not include Hauled Waste delivered directly to the Infrastructure;

"**Reasonable Wear and Tear**" means wear and tear that is reasonable given the use and age of the Infrastructure, and consistent with wear and tear that could reasonably be expected to exist at similar wastewater facilities, operating in a similar environment and similar circumstances and of a similar age, but does not mean any degradation in the operability or performance of the Infrastructure, including any components thereof, so that the Infrastructure fails to meet the Works Requirements or fails to comply with Applicable Law, any Permits and Approvals or Standards and Guidelines;

"**Registered Hauler**" means an individual truck owned and/or operated by a Hauled Waste hauling company that has been authorized by the City of Regina to dispose of Hauled Waste at the Existing Hauled Waste Receiving Station;

"**Residuals**" means the solid, semisolid or liquid residue generated during the treatment of Raw Wastewater in the Infrastructure, including screenings and grit removed from the preliminary treatment components of the Infrastructure, ash generated during incineration and refuse generated on the Lands and, for greater certainty, does not include Treated Wastewater, Digested Sludge, Dewatered Sludge Cake, Biosolids or solids removed from pump stations and lift stations;

"**Residuals Management Plan**" has the meaning indicated in Section 2.7.7;

"**SCADA**" means supervisory control and data acquisition system and is a type of PCS that includes remote monitoring and may include control of processes for multiple sites and over large distances;

"**Security Plan**" has the meaning indicated in Section 2.7.9;

"**Semi-Annual Asset Management Report**" has the meaning indicated in Section 5.7.6;

"**Service Regina**" is a branch of the City of Regina that provides customer service and call center operations for End-Users through telephone number 306-777-7000;

"**SOP**" means standard operating procedures, being quality management procedures for specific components of the Project, that form part of Project Co's Management Systems and Plans;

"**Sound Level**" means sound pressure measured in decibels using the "A" weighted network of a Sound Level Meter with fast response;

"**Sound Level Meter**" means any Type 2 or better integrating instrument that measures Sound Levels;

"**SSPC**" means the Society for Protective Coatings;

"**Staffing and Training Plan**" has the meaning indicated in Section 2.7.6;

"**Standard Methods**" means the *Standard Methods for the Examination of Water and Wastewater*, published by the American Public Health Association, the American Waterworks Association and the Water Environment Federation, as amended or replaced from time to time;

"**Standards and Guidelines**" means the standards, guidelines, policies or requirements, prescribed by the City, any Governmental Authority or any professional body, industry association or similar organization specifically referred to or incorporated by reference in this Schedule 18;

"**Temporary Sludge Storage Area**" means those lands and facilities located on the North East Quarter of Section 30, Township 17, Range 20, West of the 2nd Meridian and as shown on the drawing forming part of Appendix A - Existing Facilities Drawings attached to Schedule 7 (Existing Facilities);

"**TKN**" means Total Kjeldahl Nitrogen;

"**Transition Out Plan**" has the meaning indicated in Section 2.7.11;

"**Transition Plan for Existing Facilities O&M**" has the meaning indicated in Section 2.5.1;

"**Treated Wastewater**" means the wastewater that is treated by the Infrastructure or the Existing Facilities and discharged to Wascana Creek or supplied to End-Users;

"**Unplanned Maintenance**" means any maintenance that reduces the Available Capacity which is not Approved Planned Maintenance or any Approved Planned Maintenance which is performed outside of the approved timescales or exceeds the approved duration;

"**Wastewater Quality Reports**" has the meaning indicated in Section 5.6.5;

"**Wastewater Sampling and Analysis Plan**" has the meaning indicated in Section 2.4.3;

"**Wet Weather Flows**" means flows in excess of Full Treatment Flows; and

"**Working Cell**" has the meaning indicated in Section 5.6.10.2.

Words and abbreviations which are not defined in this Schedule 18 or the Agreement and which have well known technical or trade meanings shall be used in accordance with such recognized meanings.

Standard units of measurement may be abbreviated in this Schedule 18.

2 PROJECT CO'S MANAGEMENT SYSTEMS AND PLANS

2.1 GENERAL

Subject to the Agreement, Project Co shall develop, implement, maintain, monitor, update and manage during the Term, Project Co's Management Systems and Plans to comply with the Technical Requirements set out in this Schedule 18.

2.2 QUALITY MANAGEMENT SYSTEM

Project Co shall have a quality management system (the "**Quality Management System**") and the Quality Management System shall be one of Project Co's Management Systems and Plans. The Quality Management System shall provide a framework for the integration and structuring of the various plans and systems that comprise Project Co's Management Systems and Plans, all of which are described in this Section 2.

2.2.1 City's Quality Objectives

The Quality Management System shall support the City's requirement for Project Co to perform the Works, the O&M and the Existing Facilities O&M to quality assurance standards consistent with Good Industry Practice and the following quality objectives:

- Ensure the receipt of Raw Wastewater, delivery of Treated Wastewater and management of Residuals and Biosolids meets Good Industry Practice for environmental protection;
- Ensure that Project Co implements a well-developed quality program to meet the City's and Project Co's objectives for the fulfillment of the Agreement;
- Provide durable, dependable and high-quality assets that will meet the specified design life of the Infrastructure and provide dependable service after handback of the Infrastructure at the end of the Term;
- Complete work in accordance with schedules and deadlines;
- Integrate and coordinate designers, engineers, operators, permitting personnel and construction contractors into all development, design and review phases of the Works to verify the quality of the work;

- Develop and implement systems to ensure that problems are discovered early, resolved quickly, corrected adequately and do not recur; and

- Provide independent oversight equipped with adequate resources to ensure that quality is not compromised.

2.2.2 City's Role in Quality Assurance

Project Co shall be solely responsible for implementing the Quality Management System (including quality assurance and quality control) and shall not depend in any way on the observations of the City to substitute for its own obligations. When requested by the City, Project Co shall provide duplicate copies of Quality Management System documents and records including:

- Quality control inspection reports;

- Quality control test reports, accompanied, during the Construction Period and at Final Completion, by a declaration of review by the Project Co Engineer of Record;

- Quality control test reports, accompanied, during the Operating Period, by a declaration of review by the Project Co O&M Representative;

- Audit and non-conformance reports;

- Quality assurance reports, accompanied, during the Construction Period and at Final Completion, by a declaration of review by the Project Co Engineer of Record;

- Quality assurance reports, accompanied, during the Operating Period, by a declaration of review by the Project Co O&M Representative;

- Equipment test reports;

- Material test reports;

- CMMS and asset management records;

- Incident Logging Centre database records;

- Security reports;

- Records from the carrying out of the Wastewater Sampling and Analysis Plan;

- PCS data including archived trends for Quality Monitors, Flow Meters and Pressure Meters; and

- Quality control personnel qualifications and certifications.

2.2.3 Project Co's Quality Management Responsibilities

Project Co shall be solely responsible for the development and implementation of the Quality Management System.

The Quality Management System shall integrate permitting, design, construction, operation, maintenance and asset management and shall include detailed quality assurance and quality control procedures, staffing assignments and communication protocols, training and other aspects as set out below.

The Quality Management System shall define how Project Co shall ensure that the City's quality objectives are met, including provisions for involving representatives of the City in discussions related to quality and provisions for reporting quality assurance and quality control findings to the City.

The Quality Management System shall ensure that:

- Project staff, including any Project Co Party staff, are qualified to perform their duties and meet all necessary regulatory requirements and the Technical Requirements;

- All Project Co Parties establish and implement quality control programs that support Project Co's Management Systems and Plans as a contractual requirement;

- Project Co reviews each Project Co Party's quality plans, audits and any Project Co Party work to ensure that such Project Co Party's quality plans support Project Co's and the City's quality objectives and management system requirements;

- Materials and equipment are selected that meet the requirements of Project Co's Design and the Technical Requirements;

- Communication and co-ordination procedures among team members are clearly defined and implemented, particularly if team members are in different locations;

- Quality control activities are documented and documents are properly managed and controlled;

- During the Operating Period, periodic quality control reports include a declaration by the Project Co O&M Representative that work performed and reported in any quality control report is in accordance with the Quality Management System;

- During the Operating Period, periodic quality assurance reports include a declaration by the Project Co O&M Representative that work performed and

reported in any quality assurance report is in accordance with the Quality Management System;

- Data and information relating to the Works, the O&M and the Existing Facilities O&M is collected, stored and organized efficiently to support the management and reporting requirements of the Agreement;

- Work is properly planned and implemented according to established procedures, the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- Work is reviewed and quality processes are audited by Project Co for effectiveness;

- Deficiencies are documented and effective corrective action is promptly completed;

- Work processes are continually improved through measurement of performance against the quality objectives (including both the City's and Project Co's objectives), analysis of root causes is conducted in the event of non-conformance and feedback of lessons learned is acted upon;

- Objectives of the Quality Management System are addressed in the procurement of goods and services by Project Co's suppliers and subcontractors;

- The roles and responsibilities of the team members relative to the Quality Management System are clearly communicated;

- Until Final Completion, periodic and final quality control reports include a declaration by the Project Co Engineer of Record that work performed and reported in any quality control report is in accordance with the Quality Management System; and

- Until Final Completion, periodic and final quality assurance reports include a declaration by the Project Co Engineer of Record that work performed and reported in any quality assurance report is in accordance with the Quality Management System.

2.2.3.1 Document Control

The Quality Management System shall include Project Co's methods and systems for maintaining document control, including staff responsibilities.

Project Co shall use an internet-based document management software system to provide access to records for the City, including Existing Facilities documentation related to the Infrastructure.

Project Co shall include in the Quality Management System its methods for staff checking out files and preventing data, plans, reports, correspondence, Existing Facilities documentation related to the Infrastructure and other files and documents from being lost, stolen or misplaced.

The document control system shall be set up to facilitate development and completion of the O&M Manuals by the end of the Construction Period and to facilitate maintenance of the O&M Manuals throughout the Operating Period.

2.2.3.2 Audit Requirements

Project Co shall undertake annual Quality Management System audits to verify that the required level of Quality Management System performance during the Construction Period and the Operating Period are being or have been is achieved as required by the Technical Requirements.

Project Co shall complete a full system internal audit within one year of the date hereof and thereafter at least once per year until the end of the Term.

The Quality Management System audit shall include:

- Document reviews or system audits to ensure that Project Co has plans and procedures in place to cover all the required aspects of the Quality Management System; and

- Compliance or procedural audits to ensure that the specified plans and procedures are being effectively implemented.

Project Co shall make all Quality Management System records available to the City at all times for inspection, review and further instructions.

Project Co shall address and implement appropriate corrective measures for all Quality Management System deficiencies identified by the internal audit within 30 days of the completion of the audit. Project Co shall communicate the results of all audits to the City.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Quality Management System as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Quality Management System shall supersede and replace the existing Quality Management System and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.2.3.3 External Audits

At any time during the Term, the City may, in its sole discretion and at its sole cost, engage a third party to carry out a full system external audit of the Quality Management System to verify that the required levels of Quality Management System performance are being achieved as required under the Agreement.

Project Co shall make available to the third party auditor all Quality Management System records relating to the Project. Project Co shall address and implement appropriate corrective measures for all Quality Management System deficiencies identified by the external audit within 30 days of the City providing the external audit to Project Co.

2.2.3.4 Payment Adjustment

If a deficiency or deficiencies identified by the external audit have not been corrected within the specified time, a Payment Adjustment of $2,000/week or any partial week for the first four weeks and $5,000/week or any partial week thereafter shall apply until such deficiency or deficiencies are corrected.

2.2.4 Quality Management System Requirements

2.2.4.1 General Requirements

While ISO certification is not mandatory, Project Co shall ensure the Quality Management System is consistent with all of the requirements of ISO 9001 and cover all activities, products and services related to the Agreement prior to the execution of those activities, products and services. The Quality Management System shall address all stages of the Agreement, including:

- Design;
- Construction;
- Existing Facilities O&M;
- O&M;
- Laboratory sampling, collecting and testing;
- Asset management and renewal; and
- Performance based Payment Adjustments.

The Quality Management System shall provide guidance to ensure compliance with the Agreement, including the Technical Requirements, as well as compliance with the intent of the Technical Requirements. The Quality Management System shall include procedures to monitor, update and manage the Quality Management System on an ongoing basis and policies and procedures for implementing and assessing the effectiveness of the Quality Management System. The Quality Management System shall identify the staff responsible for carrying out quality control and quality assurance.

The Quality Management System shall require that complete testing, inspection and quality control records and reports be prepared for the Works, the O&M and the Existing Facilities O&M.

Project Co shall promptly make all Quality Management System testing, inspection and construction quality control records and reports available to the City for inspection and review, and shall provide the City with a copy of those Quality Management System records when so requested.

2.2.4.2 Design Requirements

The Quality Management System shall require that all designs and professional documents, including plans, engineering drawings, detailed drawings, maps, specifications, reports and other documents, that describe engineering or geoscientific work as contemplated in *The Engineering and Geoscience Professions Act* (Saskatchewan) be authenticated by a professional member, in accordance with the *APEGS Authentication of Documents, Use of Professional Seals* (2009).

The Quality Management System shall require that all designs and professional documents, including plans, engineering drawings, detailed drawings, maps, specifications, reports and other documents, that that describe architectural work as contemplated by *The Architects Act* (Saskatchewan) be stamped and signed by an Architect.

The Quality Management System shall require that all design work be reviewed, checked and verified by an independent reviewer (the "**Independent Reviewer**"), who shall be a Professional Engineer or Architect, as the design drawing so requires and who may be employed by the same legal entity doing the design work.

The Independent Reviewer shall provide independent design check notes and shall report that the design checks have been completed based on the information provided by the Project Co Engineer of Record and/or Project Co Architect of Record for the Works and is satisfied that the designs meet the Technical Requirements. The Independent Reviewer will then sign Project Co's design reports, the Detailed Designs and related documents.

All changes made to the design during the Construction Period must follow the same review process.

2.2.4.3 Construction Requirements

The Quality Management System shall ensure that the Infrastructure is in conformance with the requirements of Project Co's Designs, the Detailed Designs, the Works Requirements and related documents developed for the Infrastructure.

Project Co shall implement a methodology to verify compliance of the Works with the Works Requirements and changes made to the design during construction shall be stamped and signed by the Project Co Engineer of Record or Project Co Architect of Record and any such changes shall be reviewed by the Independent Reviewer.

The Quality Management System shall detail the pre-commissioning requirements, testing and acceptance program for all construction materials, products, equipment and systems, including the following:

- Importance of construction quality, including material and equipment testing and inspections, testing and inspections frequencies, quality reference standards, product acceptance and rejection criteria;

- Procedures for corrective action when quality control and/or acceptance criteria are not met;

- Procedures for inspections and, where required, receipt of the relevant permits;

- If required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals, any boilers, pressure vessels and elevating devices must comply with and be inspected by the *Technical Safety Authority of Saskatchewan* and Project Co shall have a Quality Management System program for such equipment registered and acceptable to the *Technical Safety Authority of Saskatchewan*;

- Procedures to ensure that all materials and substances that come into contact with City supplied water as part of the Works, the Existing Facilities O&M or the O&M are approved for that purpose and are protected from any cross connection;

- Feedback to designers for improvement of construction material or equipment quality;

- Procedures for recruitment, training and assignment of its skilled workforce;

- Measures to ensure that all Project Co Parties are qualified and/or licensed as required; and

- Roles and responsibilities of Project Co's staff in the quality assurance process.

2.2.4.4 O&M Requirements

The Quality Management System shall detail the following:

- Importance of overall quality in the Existing Facilities O&M and in the O&M, including monitoring, inspections and regulatory compliance, testing and inspections frequency, quality reference standards and product acceptance and rejection criteria;

- Procedures, quality control and quality assurance criteria that include clearly stated deliverables, benchmarks/baselines to facilitate the measurement, reporting, analysis and the continual improvement of the Existing Facilities O&M, the O&M and related business processes;

- Procedures, related business processes and accountabilities for inspections, monitoring, the Incident Logging Centre, complaints handling and failure rectification of the Existing Facilities O&M and the O&M;

- Procedures for recruitment, training and assignment of its skilled workforce;
- Measures to ensure that all Project Co Parties are qualified and/or licensed as required; and
- Procedures for a formal document and record management system defining the control of Incident Logging Centre, Existing Facilities O&M and O&M quality documents and records.

2.2.4.5 Laboratory Sampling, Collecting and Testing Requirements

The Quality Management System shall describe Project Co's sampling, collecting and testing procedures. To ensure the collection of representative samples and the integrity of samples, the sampling and collecting of samples shall be based on the following standards:

- Automatic composite samplers shall be calibrated at least once per quarter throughout the Term for individual sample volume;
- All samples shall be properly preserved and analyzed within the required holding times in accordance with the latest approved edition of Standard Methods;
- The refrigeration temperature for all automatic samplers and sample storage units shall be checked daily to ensure proper sample storage temperature;
- SOPs shall be developed and implemented for all sampling procedures, including sample preservation, sample container cleaning, replacement of automatic sampler tubing and automatic sampler operation; and
- Chain-of-custody protocols shall be used.

Project Co may perform laboratory testing itself or elect to use an outside Accredited Laboratory to perform any or all of the analytical testing. The Quality Management System shall ensure accuracy of all laboratory results obtained in Project Co's laboratory and auditing all results obtained from outside laboratories. The Quality Management System shall detail the following requirements:

- Written programs, procedures and standards for laboratory activities;
- Annual laboratory audits to be conducted by an independent audit agency;
- Annual laboratory review and systems audit conducted by Project Co laboratory specialists covering sampling, sample custody, sample storage and preservation, sample preparation, analytical methodology, project management and data validation;
- Precision and accuracy testing with every batch of analyses conducted each day in accordance with the Quality Management System and Standard Methods;

- Required use of bound, numbered bench sheets for recording laboratory information; and

- Use of good laboratory practice in testing, record-keeping, validating, reporting, and selection of chemicals and glassware.

The City, at its sole expense, may also perform testing, sampling, and analytical procedures as it deems necessary.

2.2.5 Annual Quality Management System Report

Throughout the Term, Project Co shall submit an annual quality management system report (the "**Annual Quality Management System Report**") summarizing the performance and efficacy of the Quality Management System. The Annual Quality Management System Report shall include:

- Status update of Project Co's Management Systems and Plans;

- Summary of all internal audits and external audits carried out;

- Explanation of any non-conformances identified and how they were resolved to ensure compliance with the Technical Requirements;

- Identification of any foreseeable and planned changes to Project Co's Management Systems and Plans;

- Description of the role and involvement of any self-certifying Project Co Party and provision of the same information listed above for such Project Co Party's quality management systems if Project Co is relying upon them; and

- Declaration by Project Co's quality assurance manager that work performed and reported in the quality assurance report is in accordance with the Quality Management System.

2.2.5.1 Payment Adjustment

If Project Co fails to provide an Annual Quality Management System Report to the City in accordance with Section 2.2.5, a Payment Adjustment of $200 will be assessed for each day or part thereof until the complete report is submitted.

2.3 ENVIRONMENTAL MANAGEMENT SYSTEM

Project Co shall have an environmental management system (the "**Environmental Management System**") and the Environmental Management System shall be one of Project Co's Management Systems and Plans. The Environmental Management System shall include:

- Project Co's corporate environmental policy stating corporate commitment and objectives for environmental management;

- A statement of the goals, objectives and/or targets of the Environmental Management System;

- An environmental management system based upon the requirements of IS0 14001 and Project Co shall obtain accreditation of the Environmental Management System for the O&M within 18 months of Substantial Completion;

- A procedure that identifies environmental aspects for the Works, the O&M and the Existing Facilities O&M and determines which of those aspects have or can have significant impacts on the environment;

- Identification of the environmental aspects for the Works, the O&M and the Existing Facilities O&M and identify which aspects are common to all facilities and which are specific to individual facilities and include a risk assessment for each aspect;

- Identification of the environmental requirements of the Permits and Approvals;

- A listing of all environmental regulatory requirements that pertain to the Works, the O&M and the Existing Facilities O&M;

- The roles and responsibilities of Project Co's environmental management team for the Works, the O&M and the Existing Facilities O&M, including a clear description and illustration of the organizational and administrative framework to be employed in the implementation and execution of the Environmental Management System, which framework must demonstrate an effective functional relationship with other components of Project Co's organization (including Project Co Parties), with any applicable Governmental Authority and with independent environmental monitors and auditors;

- A description of the communications processes for consulting and communicating with stakeholders on environmental issues and for documenting and responding to stakeholders contacts, queries and requests for information;

- A listing of the documentation to be included in the Environmental Management System and how the documents will be controlled;

- Project Co's procedure for conducting management reviews of the Environmental Management System;

- Project Co's environmental incident reporting and investigation procedures defining how incidents are reported and what techniques are used to identify the root causes and prevent recurrence;

- A procedure for reporting environmental incidents to the City and any relevant Governmental Authority;

- Procedures that ensure that any persons performing tasks for Project Co or on its behalf that have the potential to cause environmental impacts are competent on the basis of appropriate education, training or experience, together with procedures to retain these records;

- Processes for ensuring that all Project Co Parties' environmental management systems and procedures meet the City's and Project Co's environmental management standards and requirements;

- The operational controls and procedures that Project Co will implement for the Construction Period and the Operating Period;

- Procedures for an emergency preparedness and response plan for environmental incidents;

- Procedures for monitoring the key environmental aspects of the Works, the O&M and the Existing Facilities O&M that are identified as presenting the greatest environmental risks;

- Procedures for the internal audit of the Environmental Management System, including auditor qualifications, audit scope, audit objectives and audit scheduling; and

- The process for addressing any environmental non-conformances in a responsible and timely manner.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Environmental Management System that shall include a list of environmental risks.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Environmental Management System as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Environmental Management System shall supersede and replace the existing Environmental Management System and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.3.1 Payment Adjustment

If Project Co fails to obtain independent accreditation of the Environmental Management System to IS0 14001 within 18 months of Substantial Completion, a Payment Adjustment of $200 will be assessed for each day or part thereof until accreditation is obtained.

2.4 PROJECT PLANS

The following plans apply to the entire Term and form part of the Construction Period Plans, the Operating Period Plans or the O&M Plan for Existing Facilities, as applicable.

2.4.1 Health and Safety Management Plan

Project Co shall have a health and safety management plan (the "**Health and Safety Management Plan**") and the Health and Safety Management Plan shall be one of Project Co's Management Systems and Plans. The Health and Safety Management Plan shall include:

- Project Co's corporate health and safety policy stating corporate commitment and objectives for health and safety management;
- The overall strategy for work zone safety, including guiding principles and standards for work zone plans;
- The procedure for accident reporting and investigation including fulfillment of the specific requirements of the OH&S;
- The procedure for reporting accidents to the City at the time of occurrence, in a monthly summary and in a yearly summary, compiled on December 31 of each year;
- A policy for work place health and safety meetings and inspections;
- The health and safety committee provisions as required by OH&S;
- The designation and naming of a health and safety manager;
- Procedures to ensure that all Project Co Parties have the requisite health and safety training including, training for job-specific methods and specific equipment instructions;
- A description of Project Co's COR approach, including the processes for ensuring Project Co Party safety accreditation and COR status;
- Procedures for responding to violations identified by the Occupational Health and Safety Division of the Saskatchewan Ministry of Labour Relations and Workplace Safety and by the Workers' Compensation Board; and
- The approach to the integration of safety plans with other stakeholders' safety plans.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Health and Safety Management Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process

and Review Procedure), the updated Health and Safety Management Plan shall supersede and replace the existing Health and Safety Management Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.4.2 Operations Interface Plan

Project Co shall have an operations interface plan (the "**Operations Interface Plan**") and the Operations Interface Plan shall be one of Project Co's Management Systems and Plans. The Operations Interface Plan shall identify:

- Each interface point between the Infrastructure and the City and End-Users systems for both the Construction Period and Operating Period, including the interfaces for the McCarthy Boulevard Pumping Station, GTH, Spectra Energy Empress Management Inc. and Western Potash Corp.;

- For each interface point, the key operating parameters for the Infrastructure that will be required by the City or End-User for the effective and efficient operations of their systems, which operating parameters may include flow measurement, pressure measurement, various wastewater quality measurements, valve or gate positions, pump status and others as applicable;

- For each interface point, the key operating parameters of the City or End-User systems that will be required by Project Co for the effective and efficient operations of the Infrastructure, which operating parameters may include flow measurement, pressure measurement, various wastewater quality measurements, valve or gate positions, pump status and others as applicable; and

- The communication protocol between Project Co and the City and Project Co and End-Users to communicate critical changes in the key operating parameters.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Operations Interface Plan that shall include:

- Clearly defined rules and protocols governing the activities of Project Co's O&M staff to ensure that the operation of any apparatus, valve or switch that has been identified as part of a key operating parameter;

- The establishment a rolling schedule of all planned interface activities that will affect the key operating parameters, which shall, at a minimum, identify in detail the individual activities that are planned during the next 90 days and a procedure for keeping the schedule up to date;

- Plans for each interface point showing the position, isolation procedure and access provision for each interface;

- The appropriate notice periods for all interface activities that will affect the key operating parameters and such interface notice periods shall be a minimum of 14 days; and

- The contact details of all key Project Co staff and any Project Co Party responsible for each interface activity.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Operations Interface Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Operations Interface Plan shall supersede and replace the existing Operations Interface Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.4.3 Wastewater Sampling and Analysis Plan

Project Co shall have a wastewater sampling and analysis plan (the "**Wastewater Sampling and Analysis Plan**") and the Wastewater Sampling and Analysis Plan shall be one of Project Co's Management Systems and Plans. The Wastewater Sampling and Analysis Plan shall include:

- The schedule and procedures to be followed to fulfill the sampling and analysis requirements of the Agreement, any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals or the Effluent Standards.

- A description of the strategy for the daily and periodic testing of the Raw Wastewater, Treated Wastewater, grit, Biosolids and other process streams as required;

- The logistical arrangements for handling, storing and transporting samples to the laboratory;

- The laboratory analysis procedures to be followed to carry out all the wastewater quality analysis required in accordance with the relevant Standards and Guidelines;

- A description of the arrangements to maintain the Raw Wastewater or Treated Wastewater sampling points in good and safe working order;

- A description of the procedures for inspection, calibration and testing of each Flow Meter that will be relied upon for the on-line flow measurement required by Section 3 and Section 5;

- A description of the procedures for inspection, calibration and testing of each Pressure Meter that will be relied upon for pressure measurement required by Section 3 and Section 5;

- A description of the procedures to be followed in the event of a Flow Meter failure, including the contingency plans for alternative flow measurement until the meter is repaired and the response plan with timelines to effect a repair;

- A description of the procedures to be followed in the event of a Pressure Meter failure, including the contingency plans for alternative pressure measurement until the Pressure Meter is repaired and the response plan with timelines to effect a repair;

- A description of the methodology to be followed for sample result data collection, communication and archiving protocols; and

- A summary of the differences, if any, in the sampling and analysis program between the Existing Facilities and the Infrastructure.

At least 30 days prior to the day on which Project Co anticipates commencing the Liquid Stream Treatment Performance Test and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Wastewater Sampling and Analysis Plan that shall include:

- Procedures for the daily and periodic tests for the Raw Wastewater or Treated Wastewater as specified in Section 5;

- The detailed logistical arrangement for handling, storing and transporting the samples to the laboratory;

- Laboratory analysis procedures to carry out all the wastewater quality analysis as specified in Section 5;

- Procedures to maintain the Raw Wastewater and Treated Wastewater quality sampling points in good order; and

- Procedures for wastewater quality sample result data collection, communication and archiving.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Wastewater Sampling and Analysis Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Wastewater Sampling and Analysis Plan shall supersede and replace the existing Wastewater Sampling and Analysis Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.4.4 Permitting and Approval Plan

Project Co shall have a permitting and approval plan (the "**Permitting and Approval Plan**") and the Permitting and Approval Plan shall be one of Project Co's Management Systems and Plans. The Permitting and Approval Plan shall include:

- A comprehensive plan describing how Project Co intends to ensure that all required Permits and Approvals are obtained with reference to each and every permit that is required for the Works, the Existing Facilities O&M and the O&M;

- Procedures for managing all communications and submittals to the regulatory agencies, including consultation, formal applications and the review process through to receipt of the Permits and Approvals;

- The QA/QC procedures that will be followed to ensure that all of the Permits and Approvals applications and submittals are fully complete and that the information submitted is accurate and correct;

- A framework for meeting with the City and any City Parties, any applicable Governmental Authority, the End-Users and all other interested stakeholders that Project Co identifies, to collaborate on the Project, access issues, coordination issues and any other issues that may arise during the Construction Period and the Operating Period;

- The roles and responsibilities within Project Co's team for performing the permitting and approval work;

- A description of each of the main risks that Project Co foresees in securing the Permits and Approvals in a timely manner and the mitigation strategies that will be adopted;

- A detailed explanation of the scope and timing of any assistance from the City that Project Co will require in order to complete the permitting and approval process; and

- The format of the monthly permitting and approval progress reports to be submitted to the City until all Permits and Approvals are obtained and all of the conditions of the Permits and Approvals have been discharged (see Section 3), which report shall provide advance notice for any assistance that Project Co requires from City in relation to any permitting and approval activity.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Permitting and Approval Plan that shall include:

- The establishment of a Permits and Approvals registry;

- Processes and procedures for managing and maintaining the registry to ensure that it is kept up to date;

- Procedures to ensure that all of Permits and Approvals are kept in good standing.

- Procedures for all data gathering, testing, report preparation and collation of any other information required to obtain and maintain all required Permits and Approvals;

- Procedures for renewing Permits and Approvals as required; and

- Procedures for ensuring that the Permits and Approvals requirements are incorporated into the Detailed Designs, the Construction Period Plans and the Operating Period Plans, including checks to verify compliance.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Permitting and Approval Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Permitting and Approval Plan shall supersede and replace the existing Permitting and Approval Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.4.4.1 Permitting Progress and Compliance Reporting

Project Co shall submit monthly progress reports to the City to report progress in the implementation of the Permitting and Approval Plan, in the format set out therein, until all Permits and Approvals have been obtained, including the tracking, monitoring and close out of all Permits and Approvals conditions. Each monthly report shall be submitted by the 15th day of the month, reporting progress up to and including the last day of the previous month.

2.4.4.1.1 Payment Adjustment

If Project Co fails to submit a monthly permitting progress report in the form set out in the Permitting and Approval Plan, a Payment Adjustment of $200 per day will be assessed for each day or part thereof until Project Co submits the monthly permitting report in the proper form.

2.4.5 Incident Logging Centre Plan

Project Co shall have an Incident Logging Centre plan (the "**Incident Logging Centre Plan**") and the Incident Logging Centre Plan shall be one of Project Co's Management Systems and Plans. The Incident Logging Centre Plan shall include:

- A description of the communication systems and database(s) that will be used to receive, record and close out stakeholder contacts received by the Incident Logging Centre and through other media, including e-mails, faxes and written correspondence;

- The Incident Logging Centre record keeping processes and procedures and the means of making these available to the City;

- The response plans and lines to take for responding to foreseeable event notifications, including Major Incidents, Performance Failures and any other foreseeable incidents or complaints;

- Procedures to investigate complaints received from the City's "Service Regina" number and to investigate and provide responses to the City;

- Procedures to track the time taken from receipt of a query or complaint to first response and final close-out;

- Communication protocols for upward reporting of Major Incidents to the City; and

- Procedures to regularly review the effectiveness of the Incident Logging Centre Plan and to update and modify it in response to new types of query and to address any recurring issues.

The Incident Logging Centre Plan shall not replace, and is not intended to replace, Service Regina.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and Operating Period, as applicable, update the Incident Logging Centre Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Incident Logging Centre Plan shall supersede and replace the existing Incident Logging Centre Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.5 EXISTING FACILITIES O&M PLANS

2.5.1 Transition Plan for Existing Facilities O&M

Project Co shall have a transition plan for Existing Facilities O&M (the "**Transition Plan for Existing Facilities O&M**") and the Transition Plan for Existing Facilities O&M shall be one of Project Co's Management Systems and Plans. The Transition Plan for Existing Facilities O&M shall include:

- A detailed description of Project Co's approach to taking over every aspect of the Existing Facilities O&M, including transitioning all of the Permits and Approvals, replacing or retaining rolling stock and mobile equipment, supplying staffing and resources and ensuring sufficient stocks of chemicals, utilities and other consumables;

- A staffing plan for resourcing the Existing Facilities O&M to ensure that at all times a sufficient number of staff, including all required classes of operator and grades of supervisory staff, are deployed in the performance of the Existing Facilities O&M, which shall include ensuring that there are sufficient staff to cover periods of holiday, sickness and other unforeseen events;

- Identification of the key staff, including licensed operators, who will fulfill the roles identified in Project Co's staffing plan for the Existing Facilities O&M;

- A description of the Project Co Parties that Project Co will retain and employ for the performance of the Existing Facilities O&M, including the transition arrangements for such Project Co Parties;

- Procedures for transferring City staff to Project Co (including payroll, training, and benefits);

- Processes for taking over the sampling and analysis of the Treated Wastewater, including uploading historic data as required to maintain historic performance trends and rolling average performance analyses;

- Procedures for transferring from or integrating the City's phone system, 2-way radio system and communication system with End-Users to Project Co's systems;

- Procedures for transferring from the City information technology system to Project Co's information technology system (including e-mail, file server, software applications and computer hardware); and

- Project Co's communications processes and procedures for coordination with the City to ensure a seamless transition without disruption to the operation of the Existing Facilities.

Subject to Section 6 of the Agreement, Project Co shall, during the transition, update the Transition Plan for Existing Facilities O&M as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Transition Plan for Existing Facilities O&M shall supersede and replace the existing Transition Plan for Existing Facilities O&M and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.5.2 O&M Plan for Existing Facilities

Project Co shall develop and have reviewed by the City, an O&M plan for Existing Facilities (the "**O&M Plan for Existing Facilities**") that shall include:

- A description of all requirements of the Permits and Approvals and the Effluent Standards;

- A list of all mobile plant and equipment to be used for the Existing Facilities O&M;

- The SOPs for the operation and maintenance activities for the Existing Facilities which integrates the SOPs with the operation and maintenance requirements of the O&M Manuals;

- The routine maintenance program for the Existing Facilities O&M and how these activities will be delivered;

- Procedures for communications and work management systems to be used by Project Co to manage the Existing Facilities O&M staff and service providers and coordinate operations between the supervisor, Project Co Parties and operators;

- Procedures for sampling and analysis of Raw Wastewater and Biosolids;

- Procedures for the Treated Wastewater sampling and analysis to demonstrate compliance with the requirements of the Permits and Approvals;

- An emergency response plan designed specifically for the Existing Facilities O&M;

- Details of the proposed inspection, calibration and testing equipment and methodology to be followed for the Flow Meters, Pressure Meters and Quality Monitor calibrations; and

- Procedures for the preparation and submission of the monthly and annual reports required by the Permits and Approvals.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the O&M Plan for Existing Facilities as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated O&M Plan for Existing Facilities shall supersede and replace the existing O&M Plan for Existing Facilities and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.5.2.1 Payment Adjustment

If Project Co fails to follow the procedures, programs or SOPs set out in the O&M Plan for Existing Facilities, a Payment Adjustment of $500 per event or day will be assessed until the deficiency or deficiencies are corrected.

2.5.3 Existing Facilities Occupational Health and Safety Plan

Project Co shall develop and have reviewed by the City, an Existing Facilities occupational health & safety plan (the "**Existing Facilities Occupational Health and Safety Plan**") that:

- Meets the requirements of the OH&S, Good Industry Practice and the requirements set out in Schedule 16 (Safety Requirements);

- Describes the health and safety standards and practices that Project Co will implement to reduce or eliminate the occurrence of accidents while carrying out the Existing Facilities O&M;

- Identifies Applicable Law;
- Identifies the Prime Contractor, if defined in the OH&S, for the Existing Facilities O&M and states the Prime Contractor's corporate health and safety policy;
- If Prime Contractor is not defined in the OH&S, identifies the Project Co Party that will assume responsibility for health and safety for the Existing Facilities O&M and states their corporate health and safety policy;
- Sets out the safe working procedures to be followed;
- Describes Project Co's safety training programs;
- Describes Project Co's accident prevention programs;
- Sets out the roles and responsibilities of Project Co's key safety management personnel;
- Sets out the procedures to be followed in the case of emergencies including details of the manner and timing of reaction to emergencies to ensure public safety and protection of property while complying with the requirements of the Agreement regarding such matters; and
- Sets out the processes and procedures for planning, performing, reporting and closing out safety audits.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the Existing Facilities Occupational Health and Safety Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Existing Facilities Occupational Health and Safety Plan shall supersede and replace the existing Existing Facilities Occupational Health and Safety Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

If Prime Contractor becomes a defined term under the OH&S during the Construction Period, Project Co shall update the Existing Facilities O&M Occupational Health and Safety Plan to reflect the change in the OH&S. Project Co shall submit the updated plan within 30 days of the change to the OH&S taking effect.

2.6 CONSTRUCTION PERIOD PLANS

2.6.1 Design Plan

Project Co shall have a design plan (the "**Design Plan**") and the Design Plan shall be one of Project Co's Management Systems and Plans. The Design Plan shall include:

- A comprehensive plan detailing the methodology Project Co will adopt to manage the design and ensure that it complies with the Works Requirements;

- A definition and explanation of the roles and responsibilities within Project Co's team for performing the design work;
- Scope control and design input verification procedures;
- Processes and procedures to ensure that all design submittals are reviewed by an Independent Reviewer;
- Processes and responsibilities for ensuring that engineering and architectural drawing, specifications and related documents be stamped and signed by a Professional Engineer or an Architect;
- Processes and responsibilities for ensuring that engineering and architectural drawing, specifications and related documents conform to the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals with respect to building occupancy and safety;
- Systems and procedures for design document control; and
- Design changes management process to ensure that any changes to the design during the Construction Period are verified through a review process.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the Design Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Design Plan shall supersede and replace the existing Design Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.6.2 Construction Management Plan

Project Co shall have a construction management plan (the "**Construction Management Plan**") and the Construction Management Plan shall be one of Project Co's Management Systems and Plans. The Construction Management Plan shall include:

- A comprehensive plan detailing the methodology that Project Co will adopt to manage the construction and ensure it complies with the Works Requirements;
- Communication protocols and procedures for the integration of the design and construction processes;
- Scope verification and control procedures;
- Resource planning and management procedures;
- Schedule monitoring and control processes;
- Processes and procedures for coordination with Existing Facilities O&M;

- A description of the means and methods for maintaining Project Co, Project Co Party, City, City Party, staff and visitor access to the Lands and for the Existing Facilities O&M during the Construction Period;
- A description of any measures that Project Co considers are necessary to minimize impacts on the Existing Facilities O&M during the Construction Period;
- Plans and procedures to manage construction access routes for construction traffic and equipment and material deliveries during the Construction Period;
- A description of the construction staging, employee and trailer parking areas;
- A description of the security measures related to access to the Lands to be implemented during the Construction Period;
- Communication and notification protocols for both routine and emergency conditions;
- Construction procedures to ensure compliance with all environmental regulatory requirements and the environmental aspects identified in the Environmental Management System that pertain to construction;
- Procedures for topsoil handling and conservation, including storage and replacement and rutting and compaction prevention;
- Plans and procedures to ensure quality control, quality assurance and workmanship for construction activities completed during winter months;
- Procedures for dust and odour control and noise management during the Construction Period (refer to Section 3);
- Project Co's wildlife management strategies;
- Procedures for vegetation (including trees, shrubs, vines, grasses and topsoil) clearing, establishment and management (including weed control) and procedures for obtaining Permits and Approvals from any applicable Governmental Authority;
- Procedures for watercourse crossings, including in-stream activities;
- Spill prevention and response plans (refer to Section 3);
- Procedures to address groundwater protection, erosion prevention and sediment control, including the requirements of any stormwater permit(s), as applicable;
- Care of water plans, including stormwater management in accordance with the Stormwater Guidelines published by the Water Security Agency of Saskatchewan,

groundwater management, surface water management and dewatering and drainage management;

- Procedures for the continuous monitoring of surface water during the Construction Period by Project Co to ensure that any surface water contamination does not go undetected;

- Project Co's construction waste management procedures and construction waste management plans, and identify opportunities for reduction, reuse and recycling of materials, and the designated landfill where residual trash will be disposed of and include an analysis of the proposed waste expected to be generated, together with types and quantities, categorized to identify at a minimum:

    - Cardboard;

    - Clean dimensional wood;

    - Beverage containers;

    - Land clearing debris;

    - Aggregate including concrete, asphalt and masonry;

    - Metals from banding, steel stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass and bronze;

    - Gypsum board;

    - Plastic buckets (waste can be reduced by using plastic lined cardboard dry packed materials instead of premixed moist packed materials where this option is available);

    - Carpet and carpet pad trim;

    - Paint;

    - Plastic sheeting and packaging, where recycling programs are available; and

    - Rigid plastic foam insulation, where recycling programs are available; and

- The hazardous waste management procedures, including handling and disposal training requirements for Project Co and any Project Co Party staff.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the Construction Management Plan as required. Once reviewed by the City in accordance with

Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Construction Management Plan shall supersede and replace the existing Construction Management Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.6.3 Construction Occupational Health and Safety Plan

Project Co shall have a construction occupational health and safety plan (the "**Construction Occupational Health and Safety Plan**") and the Construction Occupational Health and Safety Plan shall be one of Project Co's Management Systems and Plans. The Construction Occupational Health and Safety Plan shall:

- Meets the requirements of the OH&S, Good Industry Practice and the requirements set out in Schedule 16 (Safety Requirements);
- Describes the health and safety standards and practices that Project Co will implement to reduce or eliminate the occurrence of accidents during construction;
- Identifies Applicable Law;
- Identifies the Prime Contractor, if defined in the OH&S, for the Works and states their corporate health and safety policy;
- If Prime Contractor is not defined in the OH&S, identifies the Project Co Party that will assume responsibility for health and safety for the Works and states the Prime Contractor's corporate health and safety policy;
- Sets out the safe working procedures to be followed;
- Describes Project Co's safety training programs;
- Describes Project Co's accident prevention programs;
- Sets out the roles and responsibilities of Project Co's key safety management personnel;
- Sets out the procedures to be followed in the case of emergencies including details of the manner and timing of reaction to emergencies to ensure public safety and protection of property while complying with the requirements of the Agreement regarding such matters; and
- Sets out the processes and procedures for planning, performing, reporting and closing out safety audits.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the Construction Occupational Health and Safety Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the

updated Construction Occupational Health and Safety Plan shall supersede and replace the existing Construction Occupational Health and Safety Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

If Prime Contractor becomes a defined term under the OH&S during the Construction Period, Project Co shall update the Construction Occupational Health and Safety Plan to reflect the change in the OH&S. Project Co shall submit the updated plan within 30 days of the change to the OH&S taking effect.

2.6.4 Commissioning and Startup Plan

Project Co shall have a commissioning and startup plan (the "**Commissioning and Startup Plan**") and the Commissioning and Startup Plan shall be one of Project Co's Management Systems and Plans. The Commissioning and Startup Plan shall include:

- A general description of Project Co's systematic testing and startup procedures for each unit process, as well as complete system tests that will be performed to demonstrate that the Infrastructure performs interactively and at the performance levels specified in the Technical Requirements;
- A description of the methodology for the Liquid Stream Treatment Performance Test;
- A description of the methodology for the 30-Day Performance Test;
- Processes and procedures to be followed for testing, diagnosis and correction of problems, including repeat testing where required;
- A description of the methodology for the Hydraulic Capacity Tests;
- A description of the methodology for the Odour System Performance Tests;
- The arrangements for collating and the format for reporting the results of all tests, including the Liquid Stream Treatment Performance Test, the 30-Day Performance Test, the Hydraulic Capacity Tests and the Odour System Performance Test; and
- A plan for delivering operations and maintenance training and education for Project Co and Project Co Party staff prior to Substantial Completion.

At least 30 days prior to the scheduled date of startup, operations, commissioning and process performance testing for the Infrastructure as set out in Project Co's Construction Schedule and as a condition to introducing wastewater influent flows into the Infrastructure, Project Co shall further develop and have reviewed by the City, a version of the Commissioning and Startup Plan that shall include:

- A description of the detailed methodology for the commissioning and testing of each system comprising the Infrastructure;

- The testing programs to support each specific testing objective identified in the Works Requirements;

- A detailed schedule of commissioning and startup activities, including schedule for final connections, tie-ins and the testing of all component parts of the Infrastructure, which detailed schedule must clearly identify the commissioning and startup milestones and activities that are identified in Project Co's Construction Schedule;

- The methods for introducing flow, disposing of partially treated wastewater and disposing of any sludge or other Residuals generated during the commissioning and startup testing;

- The methods for securing, utilizing and disposing of water and other materials necessary for pipeline testing;

- Specific testing procedures for the Hydraulic Capacity Tests, including methods to complete the tests even in the event that the incoming wastewater flows are below the maximum hydraulic design capacities specified in the Technical Requirements;

- Specific testing procedures for the Liquid Stream Treatment Performance Test, including methods to complete the test;

- Specific testing procedures for the Odour System Performance Tests;

- Specific testing procedures for all auxiliary systems, including HVAC, mechanical, electrical, controls, fire and life safety and security systems;

- Drawing and sketches, as required to illustrate the planned sequence of events;

- The commissioning and testing team organization and schedule, including the planned attendance of Project Co, any Project Co Parties and the City Representative;

- A list of the personnel who Project Co plans to employ for commissioning and startup with information indicating their qualifications for this work;

- Contingency plans in the event of equipment failures, instrument failures and process malfunctions;

- A listing and details for all temporary equipment (e.g. pumps) and instruments required for the commissioning and testing;

- All test parameters to be monitored and measured during startup and commissioning;

- Specific and detailed calibration methods, requirements and schedules for all testing equipment and instruments;

- Specific and detailed sample collection, handling and testing procedures to be followed including a comprehensive quality assurance and quality control program for the Liquid Stream Treatment Performance Test and the 30-Day Performance Test of the Infrastructure; and

- Response procedures for unsatisfactory test results including the definition of test result limits that constitute a failure during commissioning and startup testing.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the Commissioning and Startup Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Commissioning and Startup Plan shall supersede and replace the existing Commissioning and Startup Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.6.4.1 Payment Adjustment

If Project Co fails to submit and have reviewed by the City an updated Commissioning and Startup Plan at least 30 days prior to the scheduled date of startup, operations, commissioning and process performance testing as set out in Project Co's Construction Schedule, a Payment Adjustment of $2,000/week or any partial week shall apply until the updated Commissioning and Startup Plan is submitted.

2.6.5 Construction Period Public Communication Plan

Project Co shall have a public communication plan (the "**Construction Period Public Communication Plan**") and the Construction Period Public Communication Plan shall be one of Project Co's Management Systems and Plans. The Construction Period Public Communication Plan shall include:

- Procedures for regular reporting on construction and commissioning activities and general progress of the Works to be shared with the public, all in format, content and frequency as agreed by the City and Project Co;

- Processes for sharing the Project activity and progress information with the City in electronic format suitable for posting on a Project website and at public presentations and open houses;

- A commitment and detailed arrangements for Project Co to set up and maintain a construction site live web cam accessible by the public;

- A commitment and detailed arrangements for Project Co to support the City in hosting a public open house in Regina prior to commencing construction to explain the scope of work, construction schedule and other elements of the Works for the purpose of sharing information with the public; and

- Project Co's procedures for maintaining comprehensive records of all communication activities described above and the arrangements for access to the archived records by the City.

No later than 90 days after the date hereof, Project Co shall further develop, in consultation with the City, and have reviewed by the City, a version of the Construction Period Public Communications Plan.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and the Operating Period, as applicable, update the Construction Period Public Communication Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Construction Period Public Communication Plan shall supersede and replace the existing Construction Period Public Communication Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.6.6 Construction Period Interface Plan

Project Co shall have a Construction Period interface protocol (the "**Construction Period Interface Plan**") and the Construction Period Interface Plan shall be one of Project Co's Management Systems and Plans. The Construction Period Interface Plan shall include:

- A permit to work type control process for all interface activities, being any Project work activity outside of the areas designated and delineated exclusively for construction, including investigations, construction, startup, commissioning or testing prior to Substantial Completion which either directly interfaces with or impacts upon or has the potential to impact upon the Existing Facilities, the Existing Facilities O&M and End-Users;

- A permit to work process includes formal notices to proceed and an approval procedure for each notice to proceed, which clearly defines the role of Project Co's Existing Facilities O&M Representative in approving notices to proceed for any interface activity, acting as a responsible operator following Good Industry Practice;

- The authority of Project Co's Existing Facilities O&M Representative to withdraw a notice to proceed at any time, including before or during a planned outage, if Project Co's Existing Facilities O&M Representative determines that the operational situation has changed so that it is required to bring the Existing Facilities back into service and, in such circumstances, Project Co's construction team shall use all reasonable efforts to secure this as soon as possible;

- Procedures for reviewing, planning and scheduling the construction and commissioning activities to minimize the number and duration of interface activities and shut-downs;

- Procedures to develop and maintain plans for each construction location showing the position, isolation procedure and access provision for each interface (including domestic utility connections); and

- Procedures for any interface activities that involve plant outages or periods of reduced capacity, such outages or reduced capacity to be reviewed by the City and communicated to all of the affected stakeholders.

No later than 90 days after the date hereof, Project Co shall further develop and have reviewed by the City, a version of the Construction Period Interface Plan that shall include:

- Procedures and pro-forma for preparing detailed method statements, risk assessments and contingency plans for every interface activity, including health, safety, access, security, traffic management, permit and environmental management requirements;

- Procedures to ensure that perimeter fencing of the Existing Facilities remains intact during the execution of the interface work and, where fencing has unavoidably been removed to facilitate construction, measures put in place to maintain security and for permanent fencing to be reinstated as quickly as possible;

- The rules and protocols governing the activities of Project Co's construction staff to ensure that the operation of any apparatus, valve or switch that is part of the Existing Facilities remains under the control of Project Co's designated personnel responsible for the Existing Facilities O&M at all times;

- Establishment of a rolling schedule of all planned interface activities, which shall, at a minimum, identify in detail the individual activities that are planned during the next 90 days and a procedure for keeping the schedule up to date;

- Plans for each construction location showing the position, isolation procedure and access provision for each interface, including domestic utility connections;

- The appropriate notice periods for all interface activities and such interface notice periods shall be a minimum of 14 days; and

- The contact details of all key Project Co staff and any Project Co Party responsible for each interface activity.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period, update the Construction Period Interface Plan as required. Once reviewed by the City in accordance

with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Construction Period Interface Plan shall supersede and replace the existing Construction Period Interface Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.6.6.1 Payment Adjustment

If Project Co fails to submit an updated Construction Period Interface Plan to the City in accordance with this Section 2.6.6.1, a Payment Adjustment of $500 will be assessed for each day or part thereof until the updated Construction Period Interface Plan is submitted.

If Project Co fails to follow the Construction Period Interface Plan a Payment Adjustment of $5,000/event or day will be assessed until the deficiency or deficiencies are corrected.

If the subject activity exceeds one day duration then the Payment Adjustment shall be applied separately on each and every day until the deficiency or deficiencies are corrected.

2.6.7 Demolition and Decommissioning Plan

Project Co shall have a demolition and decommissioning plan (the "**Demolition and Decommissioning Plan**") and the Demolition and Decommissioning Plan shall be one of Project Co's Management Systems and Plans. The Demolition and Decommissioning Plan shall include:

- The scope of the Existing Facilities which are not required as part of the Infrastructure in Project Co's Designs and which are not required by the City to be maintained in service for the benefit of third parties or to maintain the Permits and Approvals;
- A detailed description of the activities associated with the removal and disposal of the stockpiles at the Temporary Sludge Storage Area;
- Site plans clearly indicating which assets will be demolished and decommissioned;
- A description of the timing and methods to use to implement the demolition and decommissioning;
- Complying with the demolition and land reclamation requirements of the Permits and Approvals, Applicable Law, Standards and Guidelines or the Governmental Authority approval requirements set out therein and as summarized in Section 3; and
- Drawings and descriptions of the remediation and landscaping to be constructed in the locations of the demolished assets.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further

develop and have reviewed by the City, a version of the Demolition and Decommissioning Plan that shall include:

- An updated scope definition and site plans defining the Existing Facilities which are not required as part of the Infrastructure in Project Co's Designs and which are not required by the City to be maintained in service for the benefit of third parties or to maintain the Permits and Approvals;
- A detailed schedule of the timing for demolition and decommissioning activities;
- Detailed methods for demolition and decommissioning activities in compliance with Section 3;
- Drawings and specifications for the remediation and landscaping to be constructed in the locations of the demolished assets;
- The detailed logistical arrangements for delivering the assets to be retained by the City as set out in Section 3; and
- The waste disposal arrangements in compliance with Section 3.

Subject to Section 6 of the Agreement, Project Co shall, during the Construction Period and the Operating Period, as applicable, update the Demolition and Decommissioning Plan. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Demolition and Decommissioning Plan shall supersede and replace the existing Demolition and Decommissioning Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7 OPERATING PERIOD PLANS

2.7.1 Operation and Maintenance Plan

Project Co shall have an operation and maintenance plan (the "**Operation and Maintenance Plan**") and the Operation and Maintenance Plan shall be one of Project Co's Management Systems and Plans. The Operation and Maintenance Plan shall include:

- Project Co's strategies for the operation and maintenance of the Infrastructure throughout the Operating Period;
- The key activities of the maintenance program during the Operating Period and how these activities will be delivered;
- Project Co's approach to the management of Wet Weather Flows, including odour control;
- The core staffing and Project Co Party resources to be deployed for the O&M;

- The vehicles and equipment to be deployed for the O&M;
- A description of the communications and work management systems to be employed by Project Co to manage the O&M staff and service providers and coordinate operations between the supervisor, Project Co Parties and operators;
- A description of Project Co's methodologies for isolating, cleaning, inspecting and maintaining all major Infrastructure components;
- A comprehensive description of the form, structure and content of the operation and maintenance manuals that will be developed and available prior to startup and commissioning;
- A plan to maintain the O&M Manuals over the course of the Operating Period, including plans for handback of the O&M Manuals at the expiry of the Term; and
- A stormwater management plan for the Lands in accordance with the Stormwater Guidelines published by the Water Security Agency of Saskatchewan.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Operation and Maintenance Plan that shall include:

- Specific goals and targets for the efficient operation and maintenance of the Infrastructure based on the Detailed Designs;
- The preventative and predictive maintenance procedures for the Infrastructure, including all wastewater process units, building maintenance, housekeeping and landscaping maintenance activities;
- The SOPs for operation and maintenance activities and integrates the SOPs with the operation and maintenance requirements of the O&M Manuals;
- The routine maintenance program for the Operating Period and how these activities will be delivered;
- Identification of staffing and Project Co Party services to be deployed;
- A list of all mobile plant and equipment to be used for the O&M;
- The detailed procedures for communications and work management systems to be used by Project Co to manage the O&M staff and service providers and coordinate operations between the supervisor, Project Co Parties and operators;
- Processes and procedures for isolating, cleaning, inspecting and maintaining all major treatment components;

- Environmental management procedures to control the environmental aspects identified in the Environmental Management System and to ensure compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals and the Infrastructure License requirements; and

- The procedure to keep the O&M Manuals and As-Built Drawings up to date in the event of changes.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Operation and Maintenance Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Operation and Maintenance Plan shall supersede and replace the existing Operation and Maintenance Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.2 Emergency Response Plan

Project Co shall have an emergency response plan (the "**Emergency Response Plan**") and the Emergency Response Plan shall be one of Project Co's Management Systems and Plans. The Emergency Response Plan shall include:

- The manner and timing of reaction to emergencies to ensure public safety and the protection of property;

- The activation process for mobilizing crews at short notice in the event of emergencies;

- A contingency plan in the event that primary staff cannot be reached;

- The training to be given to staff with respect to emergency response procedures;

- Communication strategies with the City, the public, the media, utility companies, police and fire department;

- An administrative process to collect the costs of accidents and incidents from the responsible parties;

- A description of the procedures for prompt replacement and repair of Infrastructure due to accident damage;

- The methods and procedures for debris removal; and

- Specific emergency response measures as required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Emergency Response Plan that shall include:

- The procedure for regular review and, where required, amendment to ensure that the Emergency Response Plan continues to meet the requirements required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;
- The detailed procedures for coordinating with the City of Regina Emergency Services and working with the local fire, police and other local agencies; and
- The person(s) responsible during an emergency, their duties, the response effort, the reporting requirements and preventative measures.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Emergency Response Plan. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Emergency Response Plan shall supersede and replace the existing Emergency Response Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.3 O&M Occupational Health and Safety Plan

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall develop and have reviewed by the City, an occupational health and safety plan (the "**O&M Occupational Health and Safety Plan**") that:

- Meets the requirements of the OH&S, Good Industry Practice and the requirements set out in Schedule 16 (Safety Requirements);
- Describes the health and safety standards and practices that Project Co will implement to reduce or eliminate the occurrence of accidents while carrying out the O&M;
- Identifies Applicable Law;
- Identifies the Prime Contractor, if defined in the OH&S, for the Infrastructure and states their corporate health and safety policy;
- If Prime Contractor is not defined in the OH&S, identifies the Project Co Party that will assume responsibility for health and safety for the Infrastructure and states the Prime Contractor's corporate health and safety policy;
- Sets out the safe working procedures to be followed;

- Describes Project Co's safety training programs;
- Describes Project Co's accident prevention programs;
- Sets out the roles and responsibilities of Project Co's key safety management personnel;
- Sets out the procedures to be followed in the case of emergencies including details of the manner and timing of reaction to emergencies to ensure public safety and protection of property while complying with the requirements of the Agreement regarding such matters; and
- Sets out the processes and procedures for planning, performing, reporting and closing out safety audits.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the O&M Occupational Health and Safety Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated O&M Occupational Health and Safety Plan shall supersede and replace the existing O&M Occupational Health and Safety Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

If Prime Contractor becomes a defined term under the OH&S during the Operating Period, Project Co shall update the O&M Occupational Health and Safety Plan to reflect the change in the OH&S. Project Co shall submit the updated plan within 30 days of the change to the OH&S taking effect.

2.7.4 Odour Management Plan

Project Co shall have an odour management plan (the "**Odour Management Plan**") and the Odour Management Plan shall be one of Project Co's Management Systems and Plans. The Odour Management Plan shall include:

- Odour management for the whole of the Lands to the extent of Project Co's responsibilities under this Agreement;
- A description of the odour control systems and equipment necessary to meet the requirements of Section 3 as well as the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;
- A description of the procedures for odour control for Lagoons 1S, 2A, 2, 3 and 4;
- Identification of the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals pertaining to odour control;

- A description of the Odour Verification Program;
- A response procedure to address any Odour Incident or non-conformance with the identified requirements; and
- The processes and procedures for the inspection, repair and maintenance of the odour control system(s).

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Odour Management Plan that shall include:

- A description of the odour control systems and equipment included in the Detailed Designs to meet the requirements of Section 3 as well as the requirements of the Permits and Approvals;
- A description of the procedures and strategies to minimize odour emissions from Lagoons 1S, 1N, 1N-A, 2A, 2, 3, 4, 4D, 4E and 4F in accordance with Section 5.6.10;
- A description of the procedures and strategies to minimize odour emissions from the transport and placement of Beneficially Reused Biosolids to a Working Cell in accordance with Section 5.6.10.2;
- Identification of the contemporary requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals pertaining to odour control;
- Procedures for the Odour Verification Program;
- Processes and procedures for the inspection, repair and maintenance of the odour control system(s); and
- The interface with the other relevant plans and systems forming part of Project Co's Management Systems and Plans.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Odour Management Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Odour Management Plan shall supersede and replace the existing Odour Management Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.5 Noise Control Plan

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall develop and reviewed by the City, a noise control plan (the "**Noise Control Plan**") that shall include:

- Noise control for the whole of the Lands;
- Procedures for routine monitoring and measurement of noise levels during operation of the Infrastructure to demonstrate compliance with the requirements set forth in Section 3;
- Identification of the requirements of any relevant Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals, including both environmental and occupational noise limits;
- The processes and procedures for inspection, repair and maintenance of all noise suppression and attenuation equipment;
- Procedures for the routine monitoring, measurement and reporting of noise levels;
- Response procedures to be followed in the event of complaints or that noise levels are determined to exceed the permitted levels; and
- The interface with the other relevant plans and systems forming part of Project Co's Management Systems and Plans.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Noise Control Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Noise Control Plan shall supersede and replace the existing Noise Control Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.6 Staffing and Training Plan

At least 30 days prior to the scheduled date of startup, operations, commissioning and process performance testing for the Infrastructure as set out in Project Co's Construction Schedule and as a condition precedent to Substantial Completion, Project Co shall develop and have reviewed by the City, a staffing and training plan (the "**Staffing and Training Plan**") that shall include:

- A description of the roles and responsibilities of the O&M staff, including licensed operators, management staff, laboratory staff and technical and support staff for the O&M;
- An organization chart, job descriptions, required certification and qualifications;
- Procedures to review and update the plan periodically to reflect any changes in staff and staffing needs;

- Processes to ensure that at all times a sufficient number of staff, including all required classes of operator and grades of supervisory staff, are deployed in the performance of the O&M, which shall include ensuring that there are sufficient staff to cover periods of holiday, sickness, other absences and anticipated and actual peaks in demand staffing requirements;

- A staff training needs assessment procedure to ensure that all staff receive such training and supervision as is necessary to enable them to fulfill their roles effectively;

- The training programs to be provided for all O&M staff, including safety, regulatory compliance, process control training, environmental, occupational health and safety and any other training required to fulfill any regulatory requirement; and

- The training to be provided prior to the start of the Operating Period and for new staff employed during the Operating Period, which training shall cover both the theory of operation and maintenance procedures, as well as practical training on the Infrastructure itself, and shall make use of SOPs.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Staffing and Training Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Staffing and Training Plan shall supersede and replace the existing Staffing and Training Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.7 Residuals Management Plan

Project Co shall have a Residuals management plan (the "**Residuals Management Plan**") and the Residuals Management Plan shall be one of Project Co's Management Systems and Plans. The Residuals Management Plan shall include:

- The strategy and procedures for the management of Residuals from the Lands in fulfillment of the Technical Requirements;

- Procedures to ensure that Residuals generated by the Lands are managed in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- A description of the methods to be used for collection, transportation and disposal of Residuals;

- A forecast of the quantities of Residuals and the schedule for removal of the Residuals from the Lands throughout the Operating Period, making specific reference to the plans for removal during the last two years of the Term leading up to handback;

- The sampling, analysis and record-keeping procedures to be applied for all Residuals management activities; and

- Procedures for documentation and record keeping of the removal, transporting and ultimate disposal of the Residuals.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Residuals Management Plan that shall include:

- An updated forecast of the quantities of Residuals and the schedule for removal of the Residuals from the Lands during the Operating Period, making specific reference to the plans for removal during the last two years of the Term leading up to handback; and

- The licenses and any license constraints that Project Co has secured for the Residuals disposal and for any Project Co Parties that Project Co intends to rely upon for this purpose.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Residuals Management Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Residuals Management Plan shall supersede and replace the existing Residuals Management Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.8 Biosolids and Existing Lagoons Management Plan

Project Co shall have a Biosolids and Existing Lagoons management plan (the "**Biosolids and Existing Lagoons Management Plan**") and the Biosolids and Existing Lagoons Management Plan shall be one of Project Co's Management Systems and Plans. The Biosolids and Existing Lagoons Management Plan shall include:

- The strategy and procedures for the management of Biosolids from the Infrastructure in fulfillment of the Technical Requirements;

- Procedures to ensure that Biosolids generated by the Lands are managed in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- A description of the methods to be used for processing, handling, storage, transport and beneficial reuse of Biosolids, including identifying the Existing Lagoons to be used for beneficial reuse;

- A description of the methods for minimizing stormwater runoff, minimizing leachate, minimizing odour, capping, grading and landscaping;

- A description of the methods for maintaining the Existing Lagoons and the Dewatered Sludge Cake Storage Area;

- A forecast of the quantities of Biosolids and the schedule for beneficial reuse of the Biosolids at the Existing Lagoons throughout the Operating Period, making specific reference to the plans for beneficial reuse during the last two years of the Term leading up to handback;

- The sampling, analysis and record-keeping procedures to be applied for all Biosolids management activities; and

- Procedures for documentation and record keeping of processing, handling, storage, transport and beneficial reuse of the Biosolids.

At least 30 days prior to the date on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further develop and have reviewed by the City, a version of the Biosolids and Existing Lagoons Management Plan that shall include:

- An updated description of the methods used for processing, handling, storage, transport and beneficial reuse of Biosolids, including identifying the Existing Lagoons to be used for beneficial reuse;

- An updated description of the methods to be used for minimizing stormwater runoff, minimizing leachate, minimizing odour, capping, grading and landscaping;

- An updated description of the methods to be used for maintaining the Existing Lagoons and the Dewatered Sludge Cake Storage Area; and

- An updated forecast of the quantities of Biosolids and the schedule for rehabilitation of the Biosolids at the Existing Lagoons throughout the Operating Period, making specific reference to the plans for beneficial reuse during the last two years of the Term leading up to handback.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Biosolids and Existing Lagoons Management Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Biosolids and Existing Lagoons Management Plan shall supersede and replace the existing Biosolids and Existing Lagoons Management Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.9 Security Plan

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall develop and have reviewed by the City, a security plan (the "**Security Plan**") that shall include:

- Confirmation that the Infrastructure is in compliance with the requirements of any applicable Governmental Authority and Applicable Law with respect to guarding against terrorist and security threats;

- A description of Project Co's security systems and procedures, including access control arrangements to the Lands and Infrastructure and out of hours monitoring arrangements;

- Procedures to ensure that the Infrastructure security complies with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- Procedures to monitor and address changes to the Lands, the Infrastructure, the environment or the O&M that might affect security, including physical changes, staffing levels, security procedures or perimeters;

- Procedures to audit the effectiveness of the Security Plan;

- A record of all recorded Security Plan incidents, including any security breaches or failures and Security Plan audits including non-conformances; and

- The format of the annual security report to the City, including a summary of the records referred to above.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Security Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Security Plan shall supersede and replace the existing Security Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.10 Asset Management Plan

Project Co shall have an asset management plan (the "**Asset Management Plan**") and the Asset Management Plan shall be one of Project Co's Management Systems and Plans. The Asset Management Plan shall include:

- The objectives with respect to:

    - Pursuit of continuous improvement;

    - Timely identification of performance changes;

    - Maintaining compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- Maintaining legally defensible documentation which fulfills all requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, the Permits and Approvals and the Effluent Standards;
- Triggers for outside technical support; and
- Ensuring timely responses to requests for information from the City and any Governmental Authority;

- Procedures for asset data capture to build and maintain a comprehensive record of the scope, condition and performance of the asset base, including tracking all sample analyses, maintenance records and performance records;
- Procedures to analyze the asset data collected to identify and report on performance and to identify deficiencies and develop plans for correcting those deficiencies and preventing their recurrence;
- A description of Project Co's strategy for inspection, assessment and monitoring the Infrastructure for hazards and physical condition in general;
- An asset register and asset inventory;
- Project Co's asset management team make-up and structure;
- A regime of maintenance and renewal of assets based on the condition and performance of individual assets;
- A description of the process for scheduling planned renewals and maintenance;
- A methodology for forecasting the levels of investment required in equipment, materials and systems;
- The asset modelling techniques to be used to determine asset usage to deliver the optimum life cycle performance;
- A process for detailed costing of maintenance, repair and renewal activities;
- A planned investment profile showing investment per year;
- A draft plan describing the procedures for the Annual Dependability Tests; and
- The format and contents of the Annual Asset Management Report and the Semi-Annual Asset Management Report.

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall further

develop and have reviewed by the City, a version of the Asset Management Plan that shall include:

- A detailed asset register containing details of all the assets comprising the Infrastructure, including fixed assets, moveable plant and equipment and spares;
- Processes and procedures for inspection, assessment, maintenance and renewal of assets based on the condition and performance of individual assets and systems and their criticality to the fulfillment of the Technical Requirements, the service life standards described in Section 3.7.3.5 and the license conditions;
- Processes and procedures for scheduling planned renewals and maintenance in partnership with the City and the End-Users so that the capacity of the Infrastructure is sufficient to meet the needs of the End-Users and the conditions of the Permits and Approvals at all times and to ensure that there is no disruption to the level of service received by the End-Users or adverse impacts on the environment;
- A rolling schedule for the maintenance and renewal activities, showing work planned for the next month, three months, six months, one year and the remainder of the Term;
- Asset management models to predict asset performance and renewal requirements based on the available condition and performance data;
- A CMMS to record repair, renewal and replacement of the assets on a detailed, item-by-item basis as set out in Section 5;
- A final plan describing the procedures for the Annual Dependability Tests;
- Procedures to ensure that the Asset Management Plan is maintained up to date to cover the remainder of the Operating Period; and
- Procedures to predict any future investment requirements in respect of changes to the Infrastructure to meet new or future foreseeable requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, the Effluent Standards and Permits and Approvals.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Asset Management Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Asset Management Plan shall supersede and replace the existing Asset Management Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

2.7.11 Transition Out Plan

At least 30 days prior to the day on which Project Co anticipates achieving Substantial Completion and as a condition precedent to Substantial Completion, Project Co shall develop and have reviewed by the City a transition out plan (the "**Transition Out Plan**") that shall include:

- Procedures for demonstrating that the Infrastructure complies with the Technical Requirements at the end of the Term;
- Procedures for testing any treatment processes or ancillary system for which the performance is not evidenced by the routine wastewater quality testing and, at a minimum, the Annual Dependability Test(s) shall be demonstrated as part of such testing;
- Procedures for demonstrating the functionality of the standby power systems of the Infrastructure;
- A process to ensure that all permanent instrumentation, including portable and laboratory instrumentation, is calibrated prior to the commencement of the testing and at the end of the Term;
- The organization of the test team, including responsibilities, authority and decision-making protocols;
- A schedule timetabling the activities, including submittal of all required documentation;
- A pro-forma and procedure for documenting the Treated Wastewater test results over a period of 30 consecutive days and to be performed and delivered not earlier than 180 days and not later than 90 days prior to the end of the Term to demonstrate the continued compliance of the Infrastructure with the Technical Requirements for Treated Wastewater quality; and
- A protocol for delivering split wastewater samples to the City for the City's independent testing should the City elect to conduct such tests during the testing period.

At least 5 years prior to the end of the Term, Project Co shall further develop and have reviewed by the City, a version of the Transition Out Plan that shall include:

- Full details for taking over the O&M, including transitioning of the existing service and supply agreements, replacing rolling stock and mobile equipment, supplying staffing and resources and ensuring sufficient stock of chemicals, utilities and other consumables;

- Processes for taking over the sampling and analysis of the Treated Wastewater, including uploading historic data as required to maintain historic performance trends and rolling average performance analyses;

- The staff and their roles, including licensed operators, and information with respect to any pension plans and benefit plans (including short-term benefits, long-term benefits, life insurance, accidental death and dismemberment and healthcare);

- Employee records to facilitate transition of employees; and

- The transition arrangements to the City from each of the Project Co Parties that are engaged in the O&M.

Subject to Section 6 of the Agreement, Project Co shall, during the Operating Period, update the Transition Out Plan as required. Once reviewed by the City in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure), the updated Transition Out Plan shall supersede and replace the existing Transition Out Plan and Schedule 4 (Project Co's Management Systems and Plans) shall be amended and restated accordingly.

3 WORKS REQUIREMENTS

3.1 GENERAL

This Section 3 sets forth the requirements applicable to the design, construction, performance, operation and maintenance of the Infrastructure.

Notwithstanding the specific requirements of this Section 3, Project Co shall ensure that the Infrastructure is designed and constructed to ensure continuous and uninterrupted delivery of the service to the City and End-Users and that:

- The Infrastructure is designed and constructed to be in full compliance with the Permits and Approvals;

- The Infrastructure shall reliably deliver the Design Capacity; and

- The Infrastructure shall meet the design and performance requirements set out in this Section 3.

3.2 RESPONSIBILITY FOR DESIGN

Project Co is responsible for completing the design of all elements of the Infrastructure, including all geotechnical and environmental investigations, the requirements of all authorizations (including the finalization and issuance of the Permits and Approvals) and all technical analysis required to design the Infrastructure in accordance with Good Industry Practice. In preparing the Detailed Designs for the Infrastructure, Project Co shall comply with the Works Requirements set out in this Schedule 18.

The requirements to be met in the design of the Infrastructure include considerations with respect to safety, functionality, adaptability, durability, aesthetics, operability, maintainability and life cycle cost.

The design requirements are generally specified in this Schedule 18. If a requirement is not specified in this Schedule 18, Project Co shall adhere to Good Industry Practice, the requirements of any applicable Governmental Authority, Applicable Law, Permits and Approvals and the relevant Standards and Guidelines.

Review by the City or the City Construction Representative does not imply approval and the responsibility remains with Project Co to meet the Technical Requirements.

3.3 PROJECT CO'S DESIGN DOCUMENTATION

Project Co shall prepare design documentation for the Infrastructure to meet the Technical Requirements.

Project Co shall include the following in Project Co's Designs and the Detailed Designs:

- A complete design development report provided as part of the 30% design submittal for all aspects of the Infrastructure, including:
    - Design basis, design concepts and philosophy of operation for all unit processes and disciplines including, but not limited to, architectural, structural, geotechnical, civil, mechanical, electrical, instrumentation and controls and any specialty disciplines;
    - Demonstration of the Design Capacity shall be met at all times with critical unit processes and/or equipment out of service;
    - Wastewater, solids and odour treatment process design concepts and criteria, mass balances and strategies;
    - Operation and maintenance requirements of the proposed design;
    - Description of the utility requirements for the proposed Infrastructure, including standby requirements; and
    - Hazardous area classification;
- The Detailed Designs, prepared in accordance with standard architectural/engineering practices and in accordance with other applicable requirements in the Technical Requirements; and
- Comprehensive construction specifications complying with the Construction Specifications Canada Master Format (2012) requirements, including the standard three part section format and full page width page format.

All drawings included in Project Co's Designs and the Detailed Designs shall use Imperial D size sheets and hard copies shall be plotted at true half-scale on 11" x 17" sheets. The City may, in its sole discretion, request additional full-size D drawings.

As a basis for this documentation, Project Co shall further develop and finalize, as required by this Section 3, the design development reports, plans and specifications in Project Co's Designs and the Detailed Designs, including:

- Civil design and plans showing topography, drainage, roadways, landscaping and geodetic designs of the Lands and details of tie-ins with utilities and municipal services;

- Architectural designs for the work, including to floor plans, exterior elevation drawings, interior elevation drawings showing wall-mounted accessories, exterior wall sections with key wall, window and roof junction details, roof plans, wall, ceiling and floor finish schedules, room classifications and code requirements and detailed colour, finishing and materials schedules for interior finishes, colour and materials for all exposed surfaces and exterior finishes;

- Structural designs for the work, including tank and foundation designs and superstructure framing designs including roof deck;

- Process designs for the work, including process flow diagrams and mass balances, hydraulic profiles, piping and instrumentation drawings in accordance with ISA standard 5.1 complete with all equipment tags and PLC I/O points shown, equipment and piping general arrangement drawings and odour control system;

- Unified tagging system;

- Mechanical system designs for the work, including mechanical foundation plans and sections, plumbing floor plans, heating and ventilation floor plans, fire suppression requirements, mechanical room plans, schematics and details;

- Electrical system designs for the work, including floor plans and sections for electrical power distribution system including transformers, main service, back-up generation, feeders, distribution panels and exterior power, floor plans indicating location of power, communications and fire alarm devices and tray systems, lighting floor plans and exterior lighting, lighting fixture and security system design details and device locations, power distribution to equipment, field wiring for all instruments and devices, cabling diagrams and schedules, motor starter schematics, grounding details and a power distribution load flow, coordination and arc flash study report; and

- Instrumentation and control designs for the work, including network architecture, location of field devices, cabling diagrams, schedules, panel drawings, loop diagrams and a process control narrative document describing the instrumentation

devices and control needs for the treatment processes, which shall describe the PCS hardware and software, control modes, normal and abnormal operating conditions (i.e. fault handling) and list the instruments, alarms and operator-adjustable set points.

3.4 WASTEWATER TREATMENT DESIGN AND PERFORMANCE REQUIREMENTS

3.4.1 Treated Wastewater Requirements

Treated Wastewater shall meet the requirements of any applicable Permits and Approvals, including the Effluent Standards. The Infrastructure shall also meet the Technical Requirements of which this Section 3 forms a part.

3.4.2 Influent Quantity and Quality Parameters

Table 3.4.2A and Table 3.4.2B defines the requirements for the influent quantity and quality parameters to be used by Project Co for Project Co's Designs and the Detailed Designs of the Infrastructure. The parameters in Table 3.4.2A shall be deemed to be at the boundary of the Lands upstream of the Infrastructure Diversion Chamber received from the City and End-Users.

Table 3.4.2A - Design Influent Flows and Conditions at the Infrastructure Diversion Chamber

Parameter	Unit	Quantity
Flow		
Annual average day flow	ML/d	92
Maximum day flow	ML/d	197
Peak hourly wet weather flow	L/s	5,200
Temperature		
Minimum week	Degrees C	10.0

In addition to the flows and conditions set out in this Table 3.4.2A, the following sources will be screened by the City upstream of the Infrastructure Diversion Chamber:

- Wastewater pumped from the McCarthy Boulevard Pumping Station; and
- Wastewater delivered from the future forcemain described in Section 3.7.3.14.

Table 3.4.2B - Design Flows and Loadings for Full Treatment		
Parameter	**Unit**	**Quantity**
Flow		
Sustained Minimum for Full Treatment	ML/d	156
Average Dry Weather	ML/d	86
COD		
Annual average day loading	kg/d	38,000
Maximum month average day loading	kg/d	44,000
BOD5		
Annual average day loading	kg/d	19,000
Maximum month average day loading	kg/d	22,000
Total Suspended Solids		
Annual average day loading	kg/d	23,000
Maximum month average day loading	kg/d	26,000
TKN		
Annual average day loading	kg/d	3,500
Maximum month average day loading	kg/d	3,800
Total Phosphorus		
Annual average day loading	kg/d	530
Maximum month average day loading	kg/d	570
Minimum pH		
Minimum week	pH	7.0

Project Co shall determine parameters and relationships not listed in Table 3.4.2A and Table 3.4.2B appropriate for the design, construction and operation of the Infrastructure to meet the Technical Requirements.

3.4.3 Hauled Waste Considerations

Project Co is not responsible for the design, construction or operation of a facility to accommodate the direct receipt of Hauled Waste by trucks at the Infrastructure. The City, in its sole discretion, may allow Hauled Waste to be discharged into its collection system upstream of the Lands.

3.4.4 Residuals and Biosolids Criteria

Project Co shall upgrade the Infrastructure to treat and dispose of all Residuals generated on the Lands. Project Co shall upgrade the Infrastructure to treat and dispose or beneficially reuse all Biosolids generated on the Lands. All Residuals and Biosolids must meet, at a minimum, the criteria defined in Table 3.4.4.

Table 3.4.4 – Residuals and Biosolids Criteria

Parameter	Unit	Value	Frequency of Sampling and Analysis	Averaging Period
Grit Criteria				
Percent Inert	% w/w	> 85%	Weekly	Monthly arithmetic mean
Percent Solids	% w/w	> 70%	Weekly	Monthly arithmetic mean
Biosolids Criteria				
Biosolids Classification	-	Class B		
Fecal Coliform Density	MPNs per gram per total solids	< 2 million	2 per Week	Monthly arithmetic mean
Volatile Solids Reduction	% w/w	> 38%	Daily	Monthly arithmetic mean
Percent Solids	% w/w	> 21%	Daily	Monthly arithmetic mean

Project Co shall dispose of and/or beneficially reuse Residuals and Biosolids in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. Residuals shall not be stored or disposed of on Lands. Biosolids shall be beneficially reused by placing them into the Existing Lagoons in accordance with Project Co's Biosolids and Existing Lagoons Management Plan and meeting the requirements of Section 3.4.6 and 5.6.10. Any Existing Lagoons used for temporary storage of Wet Weather Flows shall not be used for storage of Biosolids. Project Co may propose alternate methods for review in accordance with the process set out in Schedule 5 (Design and Plan Certification Process and Review Procedure).

3.4.5 Odour Criteria

Project Co shall design the Infrastructure to meet the Odour Criteria set out in Table 3.4.5 and measured as described in Section 3.7.3.19.

Table 3.4.5 – Odour Criteria Measured at the Boundaries of the Lands

Parameter	Unit	Value
Maximum Odour Unit Concentration (one hour average, 99.5% compliance level)	D/T	5

3.4.6 Existing Lagoons Requirements

Project Co shall maintain the Existing Lagoons, including liners, berms and access roadways, in accordance with Section 5.6.10 or use the Existing Lagoons as part of the Infrastructure in accordance with the allowable use stipulated in Table 3.4.6 below (each, an "**Allowable Use**"):

Table 3.4.6 – Existing Lagoons Allowable Use

Existing Lagoons	Allowable Use
Lagoon 1N-A	No Allowable Use
Lagoon 1N	No Allowable Use
Lagoon 1S	– Wet Weather Flow storage and/or emergency storage – Beneficially Reused Biosolids – No functional purpose
Lagoon 2A	– Wet Weather Flow storage and/or emergency storage – Beneficially Reused Biosolids

Table 3.4.6 – Existing Lagoons Allowable Use	
Existing Lagoons	**Allowable Use**
	– No functional purpose
Lagoon 2	– Wet Weather Flow storage and/or emergency storage – Beneficially Reused Biosolids – No functional purpose
Lagoon 3	– Wet Weather Flow storage and/or emergency storage – Beneficially Reused Biosolids – No functional purpose
Lagoon 4	– Wet Weather Flow storage and/or emergency storage – Beneficially Reused Biosolids – No functional purpose
Lagoon 4D	No Allowable Use
Lagoon 4E	No Allowable Use
Lagoon 4F	No Allowable Use

For Existing Lagoons with multiple Allowable Uses, Project Co may apply to the City to change the current Allowable Use to another Allowable Use stipulated in Table 3.4.6 and acceptable to the City, acting reasonably.

Any emergency storage considered by Project Co shall be in addition to the storage volume required for Wet Weather Flows.

3.4.7 Effluent Reuse Requirements

Project Co shall include provisions in the Detailed Designs to divert design flows downstream of the primary, secondary and final unit processes within Liquid Stream Treatment to End-Users. Such provisions shall allow for connections to the Infrastructure in the future without the need for shutting down any liquid treatment unit processes or equipment.

3.4.8 Wet Weather Flow Requirements

Unless Project Co can demonstrate equivalent functionality of an alternative design solution, Project Co shall provide a minimum of 162,000 m^3 of storage volume (based on a Full Treatment Flow of 156 ML/d) for Wet Weather Flows.

3.5 PROCESS CONTROL AND MONITORING SYSTEM

3.5.1 Facility Control System and Operator Interfaces

Project Co shall provide a PCS for the Infrastructure and well proven and reliable control systems and applications shall be used, consistent with Good Industry Practice. The PCS shall meet the reporting and data collection requirements of the Technical Requirements.

The process control and monitoring system design must address the following key design considerations:

- Simple user interface: the operator interface shall be easy to use;
- Maintainable system: ease of maintenance must be considered in the system design. System failures shall be easily isolated, repairs readily executed and replacement parts commonly available in Saskatchewan;
- System flexibility: the upgraded instruments and control system shall be adaptable to future plant expansions and modifications and use a network bus design that permits expansions and modifications; and
- System and equipment reliability: the system design shall be such that it provides failure resistance and redundancy. In addition, all equipment shall be capable of being operated manually via hard-wired control circuits (manual control shall not be performed by the PLC) and all instruments shall have local or integrated displays.

3.5.2 Instrumentation

The instruments in the Existing Facilities shall be replaced with up-to-date models unless they are in suitable working condition and are still supported with spare parts.

Project Co shall ensure that analog process transmitters:

- Provide a local indicator mounted for convenient operator access;
- Provide calculations for all Flow Meters; and
- Perform standard sizing calculations for magnetic Flow Meters and provide design criteria and such calculations shall verify velocities are suitable and provide sufficient accuracy at minimum and maximum flows.

3.5.3 On-Line Monitoring Devices

All metering requirements for the Infrastructure shall be fulfilled using continuous on–line monitoring devices. On-line analytical instruments shall be easily removed for calibration while the treatment plant is in full operation.

3.5.3.1 Flow Meters

Project Co shall provide and maintain Flow Meter(s) to measure and record:

- Total instantaneous and total daily volume of wastewater received by the Infrastructure from the City and End-Users;
- Instantaneous and total daily volume of Treated Wastewater to Wascana Creek; and
- Instantaneous and total daily volume of wastewater to Full Treatment.

Project Co shall locate the Flow Meters to ensure accurate flow measurement for compliance purposes, such locations to be determined so as to exclude any treatment process recycle and/or waste flows from the quantity measured. The Flow Meters shall:

- Measure both instantaneous flow and cumulative flow;
- Have an accuracy of +/- 5.0% or better of actual flow; and
- Continuously record and archive the flow measurement readings in the PCS.

Project Co shall submit details of its proposed Flow Meters, including the locations of the Flow Meters as part of Project Co's Designs. Project Co shall also set out in the Operation and Maintenance Plan the procedures to be implemented in the event of a Flow Meter failure.

3.5.3.2 Pressure Meters

Project Co shall provide and maintain inlet Pressure Meter(s) to measure and record the pressure of wastewater received by the Infrastructure from the City and End-Users at the Infrastructure Diversion Chamber.

Project Co shall locate the Pressure Meter(s) to ensure accurate pressure measurement for compliance purposes, such locations to be determined so as to exclude any treatment process recycle and/or waste flows from the quantity measured. The Pressure Meter(s) shall:

- Measure instantaneous pressure;
- Have an accuracy of +/- 1.0% or better of actual pressure; and
- Continuously record and archive the pressure measurement readings in the PCS.

Project Co shall submit details of its proposed Pressure Meter(s), including the locations of the Pressure Meter(s) as part of Project Co's Designs. Project Co shall also set out in the Operation and Maintenance Plan the procedures to be implemented in the event of a Pressure Meter failure.

3.6 ENVIRONMENTAL REQUIREMENTS

3.6.1 Wildlife

Project Co shall plan construction and operational activities in a manner that minimizes and eliminates any adverse impact to wildlife and wildlife habitat within the Lands.

Before construction begins, Project Co shall engage a qualified environmental scientist to conduct a nesting survey within the Lands and within 1000 metres of the Lands. If nest sites are located, mitigation measures approved by the applicable Governmental Authority and consistent with Applicable Law, Standards and Guidelines and Permits and Approvals shall be followed.

Project Co shall implement mitigation measures, as required by any Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals or Good Industry Practice, to reduce or eliminate adverse impacts, including change in habitat, change in movements and increased wildlife mortality.

Project Co shall report any impacts to protected or at-risk species or their habitats to the Governmental Authority having jurisdiction, as required by Applicable Law, Standards and Guidelines or Permits and Approvals.

3.6.2 Dust Control and Light Control

Project Co shall provide dust and light control measures as required and directed by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals.

Project Co shall not make unnecessary use of artificial light that leads to over-illumination, light trespass, glare, light clutter and skyglow. Project Co shall use lighting efficiently to ensure energy conservation. Project Co shall comply with the requirements of any applicable Governmental Authority having jurisdiction over lighting for the Works and the Infrastructure and Applicable Law, Standards and Guidelines and Permits and Approvals

Project Co shall provide all labour, materials and equipment necessary for dust and light control. Dust and artificial light pollution shall be avoided. In the event that dust and/or light attenuation may be required in order to meet the Technical Requirements or requirements set out by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals, Project Co shall indicate to the City the strategy to control dust and light in accordance with such requirements throughout the Term.

In addition, Project Co shall:

- Maintain dust control procedures during the Construction Period;

- Minimize the amount of open ground disturbed at any given time;
- Use silt fences to capture low-flying dust and debris; and
- Perform cleaning activities of the Lands as work is completed.

3.6.3 Noise

Project Co shall comply with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals regarding both environmental and occupational noise control. Project Co shall maintain records of all requirements regarding noise control as may be imposed by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals. Noise levels during the Works must conform to *The Noise Abatement Bylaw No. 6980* and the requirements of Section 3.7.3.20.

Project Co shall design the Infrastructure to control worker noise exposure and to comply with the maximum eight hour exposure levels for working areas set forth by the OH&S.

Project Co shall provide all labour, materials and equipment necessary for both environmental and occupational noise control.

Project Co shall minimize construction noise throughout the Term by incorporating mitigation measures into work plans as needed to meet the noise limits established by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals.

3.6.4 Litter

Project Co shall regularly remove all mud, dirt, debris and all other materials and liquids deposited by construction forces travelling on or using existing roads in the area during the Construction Period, in strict accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals.

Project Co shall ensure the Lands and adjacent public properties are maintained free from accumulations of waste materials and rubbish arising from the Project.

Project Co shall remove all waste materials and rubbish from the Lands regularly.

Project Co shall not burn or bury rubbish and waste materials on or adjacent to the Lands.

Project Shall not dispose of waste or volatile material, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

Project Co shall ensure that all waste is disposed of in an accepted waste management facility during the Construction Period or, where unavoidable, stored safely on the Lands in the short term and removed for disposal to an accepted waste management facility.

3.6.5 Traffic

Project Co is responsible for all required permits for transportation of equipment. All equipment and materials shall be mobilized and demobilized in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. Upon completion of the construction work, Project Co shall restore all access areas to the same or better condition as prior to the start of the work.

3.6.6 Vectors

Project Co shall effectively control vectors and pathogens that may be present on the Lands for the Construction Period to prevent human health problems. Project Co shall comply with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals regarding vector control.

3.6.7 Erosion, Sediment Control and Restoration

Project Co shall provide temporary erosion and sediment controls during and following construction until vegetation can be re-established to provide permanent erosion protection.

Project Co shall employ necessary erosion controls to prevent loss of topsoil and upper subsoil during construction and reclamation.

Project Co shall be responsible for any loss or charges created by, or resulting from, flooding of the Lands, seepage and drainage.

Project Co shall mange the aquatic impacts of erosion or sedimentation in accordance with mitigation measures as determined by any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals.

3.6.8 Aquatic Life and Spill Containment

When conducting operations adjacent to or up gradient of bodies of water during the Construction Period, Project Co shall take all reasonable precautions to avoid the release of construction materials, disturbed topsoil and subsoil or any other deleterious substances into the water body or watercourse, which may include:

- Installing silt fences, straw bale check dams or synthetic permeable ditch barriers around watercourses, bodies of water, stockpiles and across drainage paths, including slopes, ditches and watercourses;
- Use of silt fences, curtains, floating booms or cofferdams to prevent the release of deleterious substances while performing in-stream work;
- Performing work during dry and/or frozen conditions;

- Stabilizing disturbed areas, stockpiles and excavation surfaces using vegetation, erosion protection blankets or temporary covers, which stabilization measures shall be implemented within 10 days of work completion adjacent to the water body;

- Minimizing disturbance to shoreline vegetation and not servicing or refueling vehicles or equipment within 100 m of a watercourse;

- Ensuring that appropriate spill containment plans are in place, that all appropriate staff are trained in their use and proper containment kits are maintained and available; and

- Installing chemical spill containment for truck deliveries and chemical storage vessels.

3.7 TECHNICAL SPECIFICATIONS

3.7.1 Preamble

This Section 3.7 sets out the technical specifications for the design of the Infrastructure, including codes and standards to be used, functional requirements, design criteria and material specifications to be met. These technical specifications are not intended to be all inclusive of the design requirements.

Project Co shall meet the Works Requirements. However, nothing in the Works Requirements shall relieve Project Co of its obligation to meet the O&M Requirements.

3.7.2 Overall Objectives and General Requirements

Project Co shall perform the Works such that the Infrastructure is in compliance with the Works Requirements, the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals, as well as the following objectives and general requirements. Project Co shall:

- Design and construct the Infrastructure as required to meet the objectives of the Agreement, including all necessary unit processes, process control, monitoring and control, hydraulic components and redundancy to meet the Works Requirements;

- Provide the capability to safely manage all Residuals and Biosolids generated on the Lands;

- Design and construct to maximize available space for future expansion;

- Provide odour control using proven technologies and minimize Odour Complaints;

- Remove and dispose of all biological sludge and Inorganic Sludge from the Temporary Sludge Storage Area identified in Schedule 7 (Existing Facilities);

- Design the Infrastructure to meet the Design Capacity at all times. If Project Co does not provide redundant unit processes or equipment for critical systems then Project Co shall demonstrate in Project Co's design report(s) how the Design Capacity shall be met with critical unit processes and/or equipment out of service; and

- Take account of the functional and hydraulic interrelationships of the Infrastructure with the Existing Facilities, including PCS, and provide for efficient Infrastructure-wide operations during and after the Construction Period.

3.7.3 Requirements for Project Co's Designs and Detailed Designs

3.7.3.1 General

Project Co's Designs and the Detailed Designs shall comply with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals and the Technical Requirements.

These general technical specifications define the minimum design standards for the Infrastructure. Where Project Co deems that more stringent technical requirements are necessary to meet the overall Works Requirements, Project Co shall adopt such additional technical requirements in Project Co's Designs and the Detailed Designs.

For all other material or installation requirements not otherwise included in the aforementioned documents, Project Co shall follow Good Industry Practice and manufacturers' guidelines and requirements.

When requested by the City, Project Co shall provide literature, examples and other supporting evidence that demonstrates that any specifications that are proposed as an alternative to, or are in apparent conflict with this Schedule 18 will meet or surpass the level of quality and performance set out in this Schedule 18.

3.7.3.2 Reliability

Project Co shall:

- Base the design on unit processes that have a minimum of five years of full-scale operating experience at three facilities in service conditions similar to that expected in Regina and proposed by Project Co for the Project;

- Install major mechanical and electrical equipment above 1/500 Year Flood Elevation, to reduce the risk of failures caused by flooding;

- Design the Infrastructure to meet instantaneous and seasonal fluctuations and peaks in flows and loads in accordance with Good Industry Practice without undue requirements for operator intervention;

- Design the Infrastructure to operate under all reasonably foreseeable conditions, while complying with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals; and

- Ensure that all parts, equipment, systems and components shall be of new supply solely and used solely for the services of the Infrastructure, other than where such parts, equipment, systems and components are elements of the Existing Facilities that will be incorporated into the Infrastructure.

3.7.3.3 Robustness

Project Co shall:

- Select materials and the grade of those materials for each process unit and equipment item that are compatible with the environment in which the process units or equipment items are to operate;

- Select the grade or rating of equipment components to ensure that they are fit for the conditions in which they are operated and assess potential failure modes of each item of equipment;

- Ensure that all metallic buried piping, fittings and valves have appropriate sacrificial cathodic protection or are otherwise properly protected in accordance with Good Industry Practice;

- Ensure that operating strategies can be implemented that protect personnel and other equipment from harm due to failure and which, wherever possible, maintain process viability;

- Make decisions related to standby and backup equipment, isolation valves/gates, and equipment design ratings;

- Consider potential disaster scenarios, including “loss of power” situation for every item of process equipment; and

- Ensure compliance with the OH&S, including its requirements for double blocking and bleed.

3.7.3.4 Complexity

Project Co shall:

- Develop the design to allow future expansions without compromising the equipment, systems and processes incorporated in the Infrastructure;
- Include provisions in the design to divert flows downstream of every unit process within Liquid Stream Treatment to End-Users; and
- Develop a design that minimizes system complexity.

3.7.3.5 Service Life

Project Co's Designs and the Detailed Designs shall achieve the standards described in Table 3.7.3.5.

Table 3.7.3.5 – Minimum Physical Service Life for New Construction and Equipment	
Item Description	**Minimum Physical Service Life (Years)**
Transmission pipelines and yard piping	60
Structural elements, including but not limited to, tanks, foundations, structural steel and all building substructures and superstructures	50
Underground utilities, including but not limited to, water and natural gas	40
Roofing systems	20
Mechanical and electrical equipment	20
Instrumentation, control and computer equipment	10

Project Co shall provide evidence in Project Co's Designs and Detailed Designs to support the service life rating.

3.7.3.6 Ease of Operation and Maintenance

Project Co shall:

- Make all equipment accessible, with adequate clearances around equipment needing regular maintenance;

- For rotating equipment greater than 3.75 kW or with a mass greater than 100 kg, provide a minimum horizontal clearance of 1.0 metres on three sides and 1.5 metres on the fourth side and ensure that vertical clearance above the equipment to the structure (including beams) is greater than 2.0 metres for maintenance or equipment replacement;

- For rotating equipment less than or equal to 3.75 kW and with a mass less than or equal to 100 kg, provide a minimum horizontal clearance on two sides of 1.0 metres and ensure that vertical clearance above the equipment to the structure (including beams) is greater than 1.0 metres;

- Size all structures so temporary loads can be supported from the structure when equipment is removed for repair;

- Provide local shut-off switches for equipment within 3.0 metres and in the direct line of sight;

- Include in the Infrastructure an underground service and utility tunnel system linking major buildings and below ground equipment rooms that allow for equipment installation and personnel indoor access throughout the facility for maintenance and repairs. The general arrangement and tunnel system(s) shall, at a minimum, provide indoor access between the preliminary treatment, primary treatment, secondary treatment and solids treatment systems. Conduits, cables, piping, valves, instrumentation and any other equipment that would have otherwise been installed underground shall be located in the underground service tunnel system to the extent feasible and consistent with Good Industry Practice. New tunnels shall have a minimum clear distance of 2.0 m width and 2.5 m height. Dimensions for pipe racks and cable trays shall be added to these minimum dimensions; and

- Provide access paths or operator walkways to all equipment, which shall be at least 1.0 m wide where only operator access is required or, where it is necessary to move lifting devices to the equipment or to transfer equipment with a dolly when removed for maintenance, access paths or operator walkways shall be at least 1.5 m wide with a minimum headroom of 2.5 m.

3.7.3.7 Chemicals

Project Co shall:

- Ensure that chlorine gas is not permitted on the Lands for any purpose;

- Pace the chemical feed rate in proportion to flow or other process parameter to allow economic feed rate control;

- Ensure adequate mixing is incorporated so that chemical dosages are effective; and

- Account for all related chemical hazards and incorporate safety features necessary to protect all persons.

3.7.3.8 Controls

Project Co shall:

- Include in the design an explanation of how each item of the Infrastructure will be controlled;

- Provide the City with accurate, current and up to date electronic data regarding the operation of the Infrastructure, including Flow Meters in accordance with Section 3.5.3.1 and Pressure Meter(s) in accordance with Section 3.5.3.2;

- Provide the capability for Project Co to view certain parameters as described in the Operations Interface Plan for McCarthy Boulevard Pumping Station and the GTH Pumping Station;

- Select the appropriate control strategy after considering all relevant factors, including how critical the equipment is to the process, the overall plant control design philosophy and the need to modify process set points from a central location and distributed nodes throughout the Infrastructure; and

- Identify alarms that are required to protect safety, process integrity and public health.

3.7.3.9 General Infrastructure Area and Layout

Project Co shall:

- Design the Infrastructure roadway geometry to suit all reasonably foreseeable delivery and service vehicles;

- Develop a functional infrastructure arrangement in which each building's function and the access requirements for maintenance vehicles are defined;

- Ensure adequate access to the equipment;

- Plan pathways in the same manner as the roadways;

- Consider above-ground pedestrian traffic with respect to an operator's normal rounds and to traffic between buildings;

- Integrate walkways provided as part of the plant and equipment (e.g. clarifier bridges, etc.) into the overall site access arrangements for the Infrastructure;

- Undertake emergency access planning, considering requirements for ingress and egress routes for ambulances, fire trucks and other safety personnel into the roadways and pathways design to ensure that distances are not excessive between any point where accidents or fires could occur and a roadway accessible to the appropriate emergency vehicle;

- Consult any applicable Governmental Authority early in the design process to facilitate their input;

- Consider piping distances, wherever possible minimizing distances and bends of all piping arrangements; and

- Consider future requirements, including making reasonable allowances in accordance with Good Industry Practice for the installation and tie-in of future pipes, conduits, access ways, tanks, treatment processes, buildings and other infrastructure.

3.7.3.10 General Arrangement

Project Co shall:

- In a gallery or building, locate pressure vessels at least 0.6 metres from the back wall and at least 0.9 metres apart and provide sufficient space in front of the vessel for the face piping plus at least 1.2 metres;

- Provide at least 1.2 metres clearance in front of any other equipment face or panel requiring maintenance;

- Minimize piping located above blowers, compressors, or pumps to facilitate lifting;

- Provide permanently installed lift equipment with motorized overhead hoists where equipment component masses exceed 45 kg and when frequent lifting for maintenance is required;

- Allow adequate space for control panels and consider the control wiring and power wiring servicing in the layout and provide sufficient space; and

- Arrange pumps used for sludge, scum and grit pumping to minimize the distance, length of suction pipe and number of bends through which the liquid must be conveyed.

Project Co shall use commercially reasonable efforts to ensure the requirements of this Section 3.7.3.10 are met with respect to components of the Existing Facilities that will form part of the Infrastructure in accordance with Project Co's Designs.

3.7.3.11 Piping Arrangement

Project Co shall:

- Arrange sidewall pipe racks so they do not contain more than three pipes nor are more than 1.5 metres wide and, if the headroom over a pipe rack is not sufficient for personnel to access and remove interior pipes, limit pipe rack width to 1.0 metres;
- Make wall penetrations perpendicular to the wall whenever possible;
- Make full allowance in design of the process air piping for expansion and contraction due to temperatures changes as required to suit the intended service;
- Provide sludge piping with smooth flow fittings and long radius elbows and bends;
- Place flanges, grooved joint couplings or unions at appropriate spacing to allow pipe disassembly and minimize the length of runs between disassembly points for piping that may be prone to plugging;
- Arrange the layout of sludge, scum or grit piping to minimize potential plugging problems and minimize dead ends in the downstream direction in which solids could accumulate;
- Keep valves within operator reach (below 2.5 metres) as far as possible and on any valve over 2.5 metres above the operating floor, provide chain operator or valve stem extension;
- Provide sufficient straight runs for Flow Meters and other instrumentation and control elements;
- Design the pipe support/restraint system;
- Provide purge points at high points and drain points at low points of piping and ensure that these points are accessible to operating staff;
- Place utility stations in logical areas to facilitate wash down and pipe flushing so that the maximum length of hose is limited to 15 metres; and
- Locate yard hydrants at locations which facilitate tank washdown so that the maximum length of hoses is limited to 25 metres and design and install yard hydrants to ensure they do not freeze in cold weather.

Project Co shall use commercially reasonable efforts to ensure the requirements of this Section 3.7.3.11 are met with respect to components of the Existing Facilities that will form part of the Infrastructure in accordance with Project Co's Designs.

3.7.3.12 Hydraulic Elements

Project Co shall design the hydraulic components of the Infrastructure to meet the following objectives:

- Low headloss and low energy consumption;
- Minimize solids deposition where not intended;
- Ensure flow splits are within +/- 5% through parallel treatment processes and devices and demonstrate accuracy of flow splitting arrangement as requested by the City;
- Aeration of channels, as appropriate; and
- Minimize dead end channels or pipes.

Project Co shall:

- Provide for maintenance of piping and process elements;
- Follow recommendations of the Hydraulic Institute for all piping and equipment installations;
- Prepare a hydraulic profile for the Infrastructure to illustrate the routing of flow through the systems and to establish tank, channel, pipe and water elevations and the hydraulic profile shall be part of Project Co's Designs and the Detailed Designs;
- Provide gates and valves as necessary to isolate, dewater and drain each tank and treatment process for maintenance and provide functionality (bypasses, redundancy, etc.) to bypass major equipment in the event that tanks or treatment process units have to be removed from service for maintenance;
- Ensure that the hydraulic elements are able to convey the expected peak flows to the appropriate process units;
- Design piping using Good Industry Practice to calculate friction losses; and
- Design to minimize solids deposition, scum and debris accumulation under all conditions.

3.7.3.13 Demolition, Removal, Relocation and/or Replacement of Existing Facilities

Project Co shall be responsible for demolition, removal, relocation and/or replacement of the buildings, structures and equipment forming the Existing Facilities as required for construction of the Infrastructure.

Project Co shall be responsible for the demolition and decommissioning of all components of the Existing Facilities that do not form part of the Infrastructure in accordance with Project Co's Designs.

Project Co shall demolish or remove any unused equipment, above grade and below grade buildings or structures, including tanks and bypasses to Wascana Creek, in accordance with the requirements of this Section 3.7.3.13 unless otherwise directed by the City.

Project Co shall be responsible for removal off the Lands of the material and equipment located in the surplus equipment/material storage yard prior to Final Completion.

Prior to major components of the Existing Facilities ceasing operation, Project Co shall comply with the terms and conditions of any Governmental Authority having jurisdiction for reclamation and decommissioning, Applicable Law, Standards and Guidelines and Permits and Approvals.

Project Co shall:

- Ensure that all open excavation are protected prior to backfilling to ensure safety of the public;
- Ensure that abandoned lines are capped, plugged or sealed in accordance with Good Industry Practice;
- Make arrangements with the utilities to disconnect service lines entering areas to be demolished in accordance with the requirements of any Government Authority;
- Remove all existing equipment and services prior to demolition;
- Purge all underground gas piping;
- At end of each day's work, leave work in a safe condition such that no parts are in danger of toppling or falling;
- Demolish and keep materials wetted as may be required to minimize dusting;
- Sort and distribute demolished materials in accordance with the construction waste management procedures set out in the Construction Management Plan;
- Upon removal of foundation structure, basements and tanks, supply and place backfill material, which shall consist of select subgrade material;

- Ensure that any decommissioned yard piping, including bypasses to Wascana Creek, are physically plugged and isolated to prevent ingress of liquid and discharges to Wascana Creek;

- Grade all disturbed areas and level with adjacent areas, which material shall be placed in lifts to 200 mm (loose) and uniformly compacted to at least 95% of the material's standard proctor maximum dry density;

- Co-ordinate distribution of materials from the Lands in accordance with the construction waste management procedures set out in the Construction Management Plan; and

- Be responsible for the removal of all unused equipment with co-ordination through the City Construction Representative.

3.7.3.14 Infrastructure Diversion Chamber

Project Co's Designs for the Infrastructure Diversion Chamber may be modifications to the existing Condie Road Valve Chamber or a new structure. Project Co shall provide an Infrastructure Diversion Chamber that shall, at a minimum:

- Be designed and operated to receive wastewater flows from the City and End-Users;

- Ensure that all new above ground construction is within the Lands;

- Ensure that any expansion of the existing Condie Road Valve Chamber structure is within the Lands;

- Ensure that any new structures are within the Lands;

- Ensure that any new yard piping installed outside of the Lands is constructed within the limit of contract described in Figure 2 of Appendix A - Existing Facilities Drawings attached to Schedule 7 (Existing Facilities);

- Be a valve chamber or a hydraulic structure, as appropriate for Project Co's Design;

- Include a stub of minimum 1050 mm diameter on the east side of the Infrastructure Diversion Chamber that will accommodate receipt of wastewater to the Infrastructure from a future forcemain from the east; and

- Be designed to ensure the maximum pressure upstream of the Infrastructure Diversion Chamber does not exceed the following:

Table 3.7.3.14 - Hydraulic Grade Line Pressure

Maximum hydraulic grade line immediately upstream at peak hourly wet weather flow conditions	m	587.3
Maximum hydraulic grade line immediately upstream at average flow conditions	m	572.8

If the Infrastructure Diversion Chamber is designed to be a new structure, Project Co shall decommission and demolish the existing Condie Road Valve Chamber and associated piping.

3.7.3.15 Flow Diversion Chamber

It is anticipated that in the future the Effluent Reuse Pumping Station will be constructed and operated by a third party and located within or adjacent to the Lands, as directed by the City. As part of the Infrastructure, Project Co shall provide a Flow Diversion Chamber to divert Treated Wastewater away from Wascana Creek.

The Flow Diversion Chamber shall, at a minimum:

- Accept all Treated Wastewater prior to discharge to Wascana Creek;
- Have the ability to divert all, or any portions thereof, of Treated Wastewater to the Effluent Reuse Pumping Station through the use of slide gates or other means consistent with Good Industry Practice;
- Include two discharge pipes:
    - An outfall pipe directing Treated Wastewater to Wascana Creek which includes a flow control device (such as a control valve, control gate, weir gate or other Good Industry Practice) to throttle flow such that it is preferentially diverted to the Effluent Reuse Pumping Station; and
    - A minimum 1370 mm diameter pipe extending the greater of 2.0 metres from the Flow Diversion Chamber or as determined by Project Co to eliminate the potential for undermining the Infrastructure when the Effluent Reuse Pumping Station is constructed in the future. A gate or valve shall be provided at the upstream end of the pipe to allow for its isolation and provision included for double-block-and-bleed. The pipe shall be capped at the downstream end and sloped downwards at 0.2% from the Flow Diversion Chamber; and
- Include provisions for all valves, gates and appurtenances to be retrofitted with motorized actuators and other equipment as required to be controllable from the PCS.

Project Co shall allow space in Project Co's Designs and the Detailed Designs of the Infrastructure for the following:

- Minimum 10 metre width corridor for alignment of pipe from the Flow Diversion Chamber to the Effluent Reuse Pumping Station;
- Minimum 400 m^2 of space for an enclosed fenced area for the Effluent Reuse Pumping Station;
- Minimum 5 metre width corridor for driveway access for the Effluent Reuse Pumping Station; and
- Minimum 10 metre width corridor for alignment of pipe from the Effluent Reuse Pumping Station to the west boundary of the Lands.

3.7.3.16 Infrastructure Liquid Stream Treatment Process and Equipment

Project Co shall provide the City with Infrastructure that:

- Complies with the requirements set out in Section 3.4;
- Provides for a safe working environment;
- Uses proven technology;
- Includes a chemical system to disinfect Treated Wastewater utilized within the Lands as service/utility water and dosed at a rate to maintain a residual in accordance with Good Industry Practice;
- Does not permit any Bypass to Wascana Creek;
- Accepts all Raw Wastewater flows delivered to the Infrastructure Diversion Chamber from the City and End-Users;
- Does not permit treatment of wastewater in clay-lined or synthetic-lined lagoons, ponds or basins other than for Wet Weather Flows storage;
- Minimizes the impacts and disturbance to the environment surrounding the facility;
- Meets the Effluent Standards, with the exception of the *E. coli* limit, up to a 1/500 Year Flood Elevation and meets the Effluent Standards, including the *E. coli* limit, up to a water elevation in Wascana Creek of 563.7 metres;
- Hydraulically passes Treated Wastewater up to the 1/500 year Flood Elevation;
- Provides full access to Infrastructure up to a 1/500 Year Flood Elevation;

- Incorporates flexibility to upgrade in the future for additional capacity and/or improved effluent quality to meet even more stringent standards that may be required;

- Manages Wet Weather Flows;

- Provides a single Final Discharge Point to release Treated Wastewater to the receiving environment in accordance with requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals; and

- Does not include Overflow Point(s).

3.7.3.17 Infrastructure Residual and Solid Stream Treatment Process and Equipment

Project Co shall provide the City with a treatment facility that:

- meets the criteria set out in Table 3.4.4;

- does not include lime stabilization for Biosolid treatment to meet Class B; and

- does not include sludge drying (air) for Biosolid treatment to meet Class B.

3.7.3.18 Odour Control

Project Co shall design and implement odour control systems and technologies to minimize the release of odorous emissions from all sources on the Lands and as required to meet the odour criteria specified in Section 3.4.5. Negative pressure shall be maintained in all enclosed areas with odorous emission sources to contain the odour and discharge it to the odour control system, thereby reducing the potential for fugitive emissions. Additional measures shall be employed as required, such as air curtains, physical barriers, covering the working face of Beneficially Reused Biosolids, supplemental aeration, chemical addition or other means, to effectively minimize the generation of odours, contain odours and eliminate fugitive odour emissions from the Lands. Other Good Industry Practice to reduce odour generation, maximize odour containment and treatment efficiency shall be implemented by Project Co.

Project Co shall provide a weather station at the Infrastructure to continuously monitor and record weather conditions, including air temperature (wet and dry bulb), wind direction and speed, barometric pressure, humidity and precipitation.

3.7.3.19 Odour Dispersion Modelling

Project Co shall demonstrate that the Infrastructure meets the Odour Criteria (specified in Table 3.4.5) using the latest version of AERMOD, CALPUFF or other equivalent model that provides the same functionality and technical veracity, and as approved by the Saskatchewan Ministry of the Environment and the U.S. Environmental Protection Agency. The dispersion model shall include, at a minimum, input data for the most recent 5 years of meteorological data for the

Lands and odour emission rates for each odour source on the Lands. All input data shall be calibrated as required to accurately reflect the conditions of the Lands. All odour emission rates shall be corrected as required to reflect the most current version of ASTM E679 using a dynamic dilution forced-choice olfactometer method. The dispersion model shall be set up to predict maximum hourly impacts at a minimum.

Project Co shall use dispersion modelling generally following the guidelines described in Saskatchewan Air Quality Modelling Guideline and consistent with Good Industry Practice using 20 metre receptor grid spacing along the boundary of the Lands to demonstrate conformance with the Odour Criteria. If dispersion modelling demonstrates odour concentrations above the Odour Criteria, Project Co shall modify the design of the odour control system to achieve compliance and demonstrate such through additional odour dispersion modelling. For greater certainty, odour emission sources that do not need to be accounted for in the dispersion modelling are set out in Section 5.6.10.4.

Project Co shall submit a design development report with the 30 percent design submittal describing its odour control systems and providing supporting technical analysis, odour dispersion modelling, supplementary calculations, digital input/output files and other supporting documentation to demonstrate the system conforms to Odour Criteria. All odour emission rates and treatment efficiencies for odour control system components shall be based on independently published data from other municipal wastewater treatment facilities of a similar scale and climatic conditions to Regina during worst case conditions in the summer. Additional data may be used to augment independently published data where such data has been collected and reported in a manner consistent with the requirements of this Schedule 18 and Good Industry Practice and such requirements can be demonstrated. The emission rates and odour equipment treatment efficiencies proposed by Project Co shall be submitted for review by the City and supplementary information and contact information shall be provided by Project Co to verify the appropriateness of the input data. All input data to the air dispersion model and supporting calculations shall be provided to the City in digital form.

Project Co shall undertake a second stage of odour dispersion modelling during the Odour System Performance Test described in Section 3.9.1.6.

3.7.3.20 Noise Mitigation

Project Co shall be responsible for designing, installing and implementing all noise mitigation measures required to meet the Technical Requirements during the Construction Period and the Operating Period.

After Substantial Completion, noise levels for the operation of the Infrastructure shall comply with the requirements set forth below. The total sounds emissions from the Infrastructure including, but not limited to, process equipment, portable engine-driven equipment, such as standby generators and pumps, delivery and haulage trucks and maintenance equipment shall not exceed the permissible sounds levels shown in Table 3.7.3.20 at the boundary of the Lands.

Table 3.7.3.20 - Permissible Sound Levels at the Boundary of the Lands

Time Period	Maximum Permissible Continuous Sound	Maximum Permissible Non-Continuous Sound
Daytime (7:00 a.m. – 10:00 p.m.)	65 decibels Leq measured over a one (1) hour period	85 decibels Leq measured over a period of 15 minutes
Night time (10:00 p.m. – 7:00 a.m.)	55 decibels Leq measured over a one (1) hour period	75 decibels Leq measured over a period of 15 minutes

3.7.3.21 Geotechnical

Project Co is solely responsible for all geotechnical testing and analysis in the subject area as may be required to meet the Works Requirements and for any necessary authorizations from any applicable Governmental Authority.

Project Co shall provide a geotechnical report to the City as part of the 30% design submission with sufficient information to assess the anticipated soil and groundwater conditions. The geotechnical report is to contain, but not be limited to the following:

- Soil stratigraphies;
- Moisture contents;
- Plasticity;
- Estimated standard proctor optimum moisture content;
- Erodability;
- Frost susceptibility; and
- Anticipated subgrade support values.

All existing geotechnical reports are provided to Project Co for information purposes only.

Existing geotechnical reports provided to Project Co shall not be construed as imparting any duty of care to Project Co on the part of the City in relation to the accuracy of such geotechnical reports or the studies or other information contained therein, it being mutually understood and agreed that Project Co will perform its own research, investigation and due diligence for the Project.

3.7.3.22 Civil Work

The Infrastructure shall be designed and constructed to meet the following general civil work objectives and design criteria:

- The manner in which the Infrastructure is designed and constructed shall be both environmentally sustainable and compatible with the Existing Facilities and Lands conditions;

- During the design process, the existing Lands conditions shall be considered to balance the cut-and fill volumes to the maximum, feasible extent. All excess excavated material shall be preserved; Where possible, Project Co shall use suitable, excess excavated material for landscaping purposes on the Lands;

- All Infrastructure shall be arranged on the Lands in a manner that access to the Lands complies with both emergency and fire vehicle requirements and provides safe access into and throughout the Lands;

- The Infrastructure design and layout shall be such that operation, maintenance, and monitoring can be done easily to optimize operational data collection, storage and use;

- The design will include open space on the Lands to allow for future expansion, located such that construction of future Infrastructure expansions shall not interfere with the ongoing operation of the Infrastructure;

- The Infrastructure layout, building design, and landscaping shall be such that a well-kept appearance is provided while minimizing the frequency of required maintenance;

- Demolition, removal, relocation and/or replacement of components must be completed as described in Section 3.8.7.11; and

- The Infrastructure will be secured from unauthorized access by adequate security fencing, including replacing existing sections of fencing such as the fence in the ditch along Condie Road.

The specific civil work design criteria shall meet the following requirements:

- Lands access, hydraulic profile and Raw Wastewater and Treated Wastewater conveyance facility locations shall be carefully considered and arranged in the design as to not interfere with the existing utilities and water wells and to allow for future expansion;

- The Infrastructure must remain fully operational, accessible and protected from physical damage by the 1/500 Year Flood Elevation and earthwork to raise the Infrastructure may be required;

- Any above-ground tanks and buildings must not be constructed within 60 metres from the normal high water level or top of bank of Wascana Creek based on gradient break and/or riparian vegetation, whichever is farthest from creek centre,

or such other set back mandated by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals;

- Provision and maintenance of walk-up access to all equipment and cart access to all equipment that is greater than 50 kg;
- Provision and maintenance of access for tote and bulk chemical deliveries at the Infrastructure as required;
- Provision and maintenance of safe operator and maintenance vehicle access to the Infrastructure during all seasonal conditions;
- All surface runoff and stormwater from the Lands shall be collected and managed according to the City stormwater management guidelines and as described in Sections 3.8.8.3 and 3.7.3.24;
- Separation and treatment of all surface runoff from areas in the Infrastructure that may contain spills from the treatment processes; and
- Provision of administration space that includes lab space, restrooms, change rooms, lunch area, office area and a maintenance shop/area to accommodate the entire intended work force plus ten percent.

3.7.3.22.1 Design Codes

Materials and installation methods called for in the design of civil works shall include yard piping, utility services, perimeter fencing and landscaping and shall conform to the City of Regina Standard Construction Specifications Manual.

Materials called for in the Detailed Designs shall comply with all applicable CSA, ASTM, AWWA and NSF standards, including but not limited to the following:

Pipe:

CAN/CSA B137.3	Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications
NSF/ANSI 61	Drinking Water System Components
AWWA C900	PVC Pressure Pipe and Fabricated Fittings 4”-12” (100mm-300mm) for Water Distribution
AWWA C905	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 14”-48” (350mm-1200mm) for Water Transmission and Distribution

ASTM D1248	Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings 4 inch (100mm) through 63 inch (1575mm) for Water Distribution and Transmission
ASTM A53B/A53M	Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless
CSA Z245.1	Steel pipe
CAN/CSA B182.2	PSM type polyvinylchloride (PVC) sewer pipe and fittings
CAN/CSA B182.4	Profile polyvinylchloride (PVC) sewer pipe and fittings
ASTM D3034	Standard Specification for Type PSM polyvinylchloride (PVC) Sewer Pipe and Fittings
ASTM F679	Standard Specification for polyvinylchloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

Fittings:

AWWA/C110/A21.10	Ductile-Iron and Gray-Iron Fittings
AWWA C111/A21.11	Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
CAN/CSA B137.2	Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications
AWWA C907	Injection-moulded polyvinylchloride (PVC) Pressure Fittings, 4 In. Through 12 In. (100 mm Through 300 mm) for Water Wastewater, and Reclaimed Water Service
ASTM D2683	Standard Specification for Socket Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing

ASTM D3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASMI/ANSI B16.3	Malleable Iron Threaded Fittings: Classes 150 and 300
ASTM A234/A234M	Standard Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM A356/A356M	Standard Specification for Steel Castings, Carbon, Low Alloy, and Stainless Steel, Heavy Walled for Steam Turbines

Valves:

AWWA C509	Resilient Seated Gate Valves for Water Supply Service
AWWA C515	Reduced Wall, Resilient Seated Gate Valves for Water Supply Service
AWWA C504	Rubber-Seated Butterfly Valves, 3 In. through 72 In. (75 mm through 1,800 mm)

Structures:

ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
CSA A3001	Cementitious Materials for Use in Concrete
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C923M	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pips and Laterals (Metric)
ASTM A48	Standard Specification for Gray Iron Casting

3.7.3.22.2 Design Criteria

Project Co shall design the civil works according to the standards outlined in the City of Regina Development Standards Manual.

3.7.3.23 Roads, Sidewalks, Parking and Traffic Circulation

Project Co shall design, construct and maintain the road and parking system to meet the following objectives:

- Roadways, parking and maneuvering areas efficiently and safely provide for anticipated traffic level on the Lands including facility staff, visitors, standard trucks, tractor trucks and semi-trailers used for chemical and other deliveries, Residuals and Biosolids hauling and for emergency rescue vehicles, including firefighting and rescue equipment;

- All roadways, excluding roadways on the Existing Lagoons berms, shall be paved and paving design shall be in accordance with Project Co's traffic loadings and the design codes and design criteria specified in this Schedule 18;

- In the locations where Project Co elects to use drainage structures, curbs and gutters, such drainage structures, curbs and gutters shall be in accordance with the City of Regina Standard Construction Specifications Manual and shall correspond to the paving design selected;

- Circulation patterns and roadways on the Lands are arranged to minimize the interaction of commercial vehicles with staff and visitor vehicles;

- Parking for visitors is clearly marked and located to provide easy access to the administration building and the minimum number of visitor parking spaces, including handicapped accessible stalls, shall be provided in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- Electrified staff parking spaces are available, including handicapped accessible stalls, in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;

- Construction and operations traffic shall be considered during the roadway and parking design and the overall approach shall consolidate construction traffic to minimize impacts to the Lands and surrounding environments and to ensure efficient deliveries and pickups during construction and operation;

- The roadway width, radius of curvature, sight distances, grades and vertical curves of all Lands roadways shall conform to with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals and Good Industry Practice;

- Signage shall clearly direct visitors to the administration facilities and delivery trucks to the delivery and storage areas and all buildings shall be clearly identified to comply with the fire code; and

- Grading of adjoining surfaces at road edges and subsurface intercept drains shall be performed as necessary to prevent run-on of precipitation and snowmelt.

3.7.3.23.1 Design Codes

Materials and installation methods called for in the design of roadways, sidewalks, and parking areas serving the site shall conform to the City of Regina Standard Construction Specifications Manual.

Materials called for in Project Co's Designs and the Detailed Designs shall comply with all applicable CSA and ASTM standards, including:

Asphaltic Concrete:

ASTM D692/D692M	Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Bituminous Paving Mixtures
ASTM D4867/D4867M	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5/D5M	Standard Test Method for Penetration of Bituminous Materials
ASTM D2171/D2171M	Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer
ASTM D92	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D1754/D1754M	Standard Test Method for Effect of Heat and Air on Asphaltic Materials (Thin Film Oven Test)
ASTM D113	Standard Test Method for Ductility of Bituminous Materials
ASTM D2042	Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene

Portland Cement:

CSA A3001	Cementitious Materials for Use in Concrete
CAN/CSA-A23.1	Concrete materials and methods of concrete construction

ASTM C260/C260M	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C494/C494M	Standard Specification for Chemical Admixtures for Concrete

3.7.3.23.2 Design Criteria

Project Co shall design the roadways, sidewalks, parking and traffic circulation to comply with the following design codes:

- City of Regina Development Standards Manual for Transportation Design;
- Transportation Association of Canada Geometric Design Guide for Canadian Roads;
- Transportation Association of Canada Manual of Uniform Traffic Control Devices for Canada; and
- City of Regina Standard Construction Specification Manual.

3.7.3.24 Stormwater

Project Co shall design, construct, maintain and manage all service roadway, parking lot and building collection and drainage systems at the Infrastructure for the duration of the Construction Period and the Operating Period. In addition to new stormwater drainage facilities, Project Co may modify existing stormwater drainage facilities to meet the stormwater management requirements.

Project Co shall obtain the required approvals and plan, design and operate stormwater drainage system(s) on the Lands based on the Water Security Agency of Saskatchewan Stormwater Guidelines. Project Co is solely responsible for the stormwater management of the Existing Facilities and the Infrastructure.

To ensure that sediment does not enter natural drainage paths, grades shall be sloped away from drainage courses. Any water entering the storm drainage systems shall be in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals and Good Industry Practice. All erosion and sediment control measures shall be inspected every seven days and following storm events and/or snowmelts and repaired or replaced and cleaned as necessary. Sediment is to be removed from silt fence when the sediment level reaches half the silt fence height.

The Infrastructure shall be protected from physical damage and remain fully accessible during the 1/500 Year Flood Elevation.

Snow management during the Operating Period shall be considered in Project Co's Designs and Detailed Designs.

3.7.3.24.1 Design Codes

Materials and installation methods called for in the design of stormwater systems, structures and conveyances serving the Lands shall conform to the City of Regina Standard Construction Specifications Manual.

Materials called for in the Detailed Designs shall comply with all applicable CSA and ASTM standards, including:

Pipe:

ASTM C76M	Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric)
ASTM C655	Standard Specification for Reinforced Concrete D Load Culvert, Storm Drain and Sewer Pipe
CAN/CSA B182.1	Plastic drain sewer pipe and fittings
CAN/CSA B182.2	PSM type polyvinylchloride (PVC) sewer pipe and fittings
CAN/CSA B182.4	Profile polyvinylchloride (PVC) sewer pipe and fittings
ASTM D3034	Standard Specification for Type PSM polyvinylchloride (PVC) Sewer Pipe and Fittings
ASTM F679	Standard Specification for polyvinylchloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
CAN/CSA G401	Corrugated steel pipe products

Structures:

ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
CSA A3001	Cementitious Materials for Use in Concrete
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C923M	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and pipes (Metric)

ASTM A48/A48M	Standard Specification for Gray Iron Casting
ASTM A27/A27M	Standard Specification for Steel Castings, Carbon, for General Application

3.7.3.24.2 Design Criteria

Stormwater systems, structures and conveyances shall be designed according to the standards outlined in the City of Regina Development Standards Manual for stormwater collection systems.

3.7.3.25 Security

Project Co shall be responsible for ensuring the security of the Infrastructure located within the Lands. At a minimum, each of the buildings comprising the Infrastructure shall be equipped with a dedicated security system to monitor all entrance ways.

Project Co shall provide security fencing around the Infrastructure to prevent any intentional or unintentional access by unauthorized vehicles or individuals. In its design of the security fencing, Project Co shall give particular consideration to preventing access by snowmobiles to the Existing Lagoons. Infrastructure within the Lands shall be fully enclosed with appropriate perimeter fencing and gates to prevent public access during all seasons.

3.7.3.26 Service Connections

Project Co shall be responsible for the following:

- Connection of Infrastructure service lines to existing lines and sources, regardless of whether the required work is performed by Project Co's staff, a Project Co Party or by the utility;
- Co-ordination of service connection work and making of all necessary arrangements with, compliance with requirements of, and full cooperation with each utility; and
- Service connection charges, if any, levied by each utility.

Project Co shall separately provide its own fuel requirements for all construction during the Construction Period and shall coordinate with the utility, as required, to meet the demands of the Infrastructure.

If required, Project Co shall coordinate with the utility to supply and install new transformers including primary meter and medium voltage cables between the existing medium voltage pad mount switch and any new transformer location as decided by Project Co. Project Co shall supply and install required transformer pad, medium voltage cable duct bank and low voltage cables between transformer and switchgear if required by the Infrastructure design.

Project Co shall protect all cabling and connection points during any demolition or relocation of telephone, internet, or other communication services. Project Co shall also reconnect, test and commission all points upon Substantial Completion of the Infrastructure.

3.7.3.27 Structural

Project Co's Designs and the Detailed Designs for the structures shall comply with the design codes in the NBCC.

All new process buildings constructed as part of the Infrastructure shall use either masonry, cast-in-place concrete or precast concrete walls and pre-cast concrete or cast-in-place concrete roof structures.

The buildings shall be designed to the applicable CSA standards and the liquid retaining concrete tanks shall be designed to the applicable ACI standards. The design of the structures shall comply with all applicable standards, including but not limited to the following:

Structural Steel:

CSA-S16	Design of Steel Structures.
CISC	Code of Standard Practice for Structural Steel.
CISC	Handbook of Steel Construction.

Concrete:

CAN/CSA-A23.3	Design of Concrete Structures.
ACI 318M	Building Code Requirement for Structural Concrete.
ACI 350M	Code Requirement for Environmental Engineering Concrete Structures.
ACI 350.3	Seismic Design of Liquid Containing Concrete Structures.

Foundations and Piling:

Canadian Foundation Engineering Manual, Canadian Geotechnical Society.

Aquifer protection in accordance with City of Regina Bylaw 9250.

New structures shall be designed to facilitate efficient removal and/or replacement of process equipment and hoists.

3.7.3.28 Architectural

3.7.3.28.1 Architectural Reference Standards

This section covers standards pertaining to major architectural elements assumed to be part of design. A wide variety of finish materials is possible and finishes are not included in this list. Criteria for selection of finishes and other architectural elements shall include durability, corrosion protection and ease of maintenance.

Building Codes include:

1. NBCC.
2. *The Uniform Building and Accessibility Standards Act* (Saskatchewan).
3. National Fire Code of Canada.
4. The design of the Infrastructure shall meet the ventilation, extent of classified area, electrical classification, material of construction for Buildings or Structures and Fire Protection measures described in Chapters 4, 5 and 6 of NFPA 820 and follow applicable Good Industry Practice described elsewhere in NFPA 820.

Reference Standards include:

1. Precast Architectural Concrete:

CSA A23.4	Precast Concrete-Materials and Construction.

2. Masonry:

CAN/CSA A179	Mortar and Grout for Unit Masonry.
CAN/CSA A370	Connectors for Masonry.
CAN/CSA A371	Masonry Construction for Buildings.
CSA S304.1	Design of Masonry Structures.
CAN/CSA A165 Series	Concrete Masonry Units.

3. Metal Fabrications:

ASTM A53/A53M	Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated Welded and Seamless.
ASTM A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

4. Board Insulation:

CAN/ULC S701	Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
CAN/ULC S702	Standard for Mineral Fibre Thermal Insulation for Buildings.
CAN/ULC S704	Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

5. Air Barriers:

CAN/CGSB 149.10M	Determination of Airtightness of Building Envelopes by the Fan Depressurization Method.
.1	Perform Work to achieve a maximum tested air infiltration of 0.7 cm^2/m^2 of building envelope when tested in accordance with CAN/CGSB-149.10M.

6. Applied Fireproofing:

CAN/ULC S101	Standard Methods of Fire Endurance Tests of Building Construction and Materials.
CAN/ULC S102	Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

7. Firestopping:

CAN/ULC S115	Standard Method of Fire Tests of Firestop Systems.

8. Metal Doors and Frames:

CSDMA	Recommended Specifications for Commercial Steel Doors and Frame Products.
CSDMA	Recommended Selection and Usage Guide for Commercial Steel Door and Frame Products.
CAN/ULC S104	Standard Method of Fire Tests of Door Assemblies.
CAN/ULC S105	Standard Specification for Fire Door Frames. Meeting the Performance Required by CAN/ULC S104

ASTM A653/A653M	Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
ASTM A167	Standard Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet and Strip.

9. Windows:

CSA A440/CSA A440.1	Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
CAN/CGSB 12.20M	Structural Design of Glass for Buildings.
.1	Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with NBCC to a design pressure windload per 30 year occurrence.
.2	Limit mullion deflection to L/240; with full recovery of glazing materials.
.3	Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
.4	Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

10. Painting:

MPI	Architectural Painting Specification Manual.
SSPC	Systems and Specifications, SSPC Painting Manual.

3.7.3.28.2 Design Philosophy

Project Co's Designs and the Detailed Designs shall:

- Meet all functional needs;

- Recognize and enhance the environmental systems and promote sustainability by the incorporation of sustainable design systems into the building concept;
- Use materials and components that ensure minimum inconvenience and disruption from breakdowns, repairs and maintenance activities;
- Conform to the design review requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals; and
- Comply with the following codes and guides:
    - NBCC;
    - *The Saskatchewan Fire Code Regulations*;
    - OH&S; and
    - the *Canada Occupational Health and Safety Regulations*.

3.7.3.28.3 Building Envelope

The Infrastructure shall include administration and maintenance facilities with sufficient space and amenities in accordance with Good Industry Practice and any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals, including, at a minimum, lab space, restrooms, change rooms, lunch area, office area and a maintenance shop/area to accommodate the entire intended work force plus ten percent. All Infrastructure buildings must be permanent structures, not trailers or mobile units.

Project Co shall provide and maintain in the administration facilities an office for exclusive use by City with the following features:

- Separate access from outside or corridor;
- Minimum size to be 12.6m^2;
- Furnished with a desk, 3 chairs, one drawer file cabinet, plan table (minimum size 900 mm by 1200 mm), plan rack, shelves, waste basket and coat rack;
- Equipped with one telephone line (including handset) and one computer line that has access to a high speed broadband connection;
- Access via wireless or hardwired to colour printer near office;
- Access to photocopier near office;
- Access to washroom facilities near office; and

- Furnished with adequate heating, ventilation and lighting.

The office shall be secured by lock and key and acceptable to the City acting reasonably and access shall be provided during normal working hours. Project Co shall provide one parking spot designated for the sole and exclusive use of the City.

3.7.3.29 Electrical Design Requirements

3.7.3.29.1 General

Project Co shall provide only industrial grade equipment, components and solutions provided by standard manufacturers normally involved in the provision of equipment to the water and wastewater treatment industry.

The area where the Infrastructure is located has experienced power cycling and power fluctuations. Project Co shall mitigate the effects of these occurrences and ensure that the Infrastructure continues to meet the Effluent Standards. Considerations shall include a redundant feeder line and standby generation capacity in accordance with Good Industry Practice. At a minimum, Project Co shall provide standby power generation as required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals and at a minimum sufficient capacity for life safety systems, critical process equipment and control systems to ensure the requirements for *E. coli*, acute toxicity and un-ionized ammonia set out in the Effluent Standards are met at all times during power outages.

Project Co shall not use pole mounted feed lines in the Lands. Project Co shall remove and dispose of the existing poles and assorted feed lines.

The existing utility service, standby generation system(s) and power distribution shall be upgraded to cope with the new and increased Infrastructure load. Project Co shall use 600 V equipment for any newly installed systems and services.

Project Co shall ensure that sufficient harmonic filtering and automatic power factor correction units and distribution switchgear are included at each motor control centre to maintain the power factor at each bus above 0.95%.

The Infrastructure shall meet the current codes specified in the latest edition of the CEC and the variations made thereto by Saskatchewan regulation, provided that, in cases where the Existing Facilities are utilized as part of the Infrastructure, the electrical systems of such Existing Facilities shall be upgraded to meet the current code, including where an area is changed from an unclassified area to a classified area, in accordance with any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals.

Project Co shall maintain the existing electrical supply between the Infrastructure Diversion Chamber and the GTH Valve Chamber to allow the City to continue to operate the automated valves in the GTH Valve Chamber.

3.7.3.29.2 Codes and Standards

Project Co's Designs and the Detailed Designs shall incorporate the following electrical design criteria:

- Compliance with the CEC and rules and regulations made pursuant thereto;
- Unless otherwise indicated, all references in the Agreement to the CEC shall mean the latest edition of the CEC, Part I, CSA C22.1 and the variations made thereto by Saskatchewan regulation;
- Compliance with CSA C282 - Emergency Electrical Power Supply For Buildings;
- All electrical products shall be tested, certified and labelled in accordance with a certification program accredited by the Standards Council of Canada and where a product is not so labelled, Project Co shall provide the City with written approval by the applicable Governmental Authority authorizing the use of such electrical product;
- The design of the Infrastructure shall meet the ventilation, extent of classified area, electrical classification, material of construction for Buildings or Structures and Fire Protection measures described in Chapters 4, 5 and 6 of NFPA 820 and follow applicable Good Industry Practice described elsewhere in NFPA 820;
- Submission to any Governmental Authority and the utility company of the necessary number of drawings and specifications for examination and approval prior to commencement of electrical work; and
- Submission of a copy of the electrical permit to the City obtained from the Governmental Authority.

3.7.3.29.3 Certificates

When any Governmental Authority conducts an electrical inspection, Project Co shall submit to the City a copy of the certificate of acceptance provided by the Governmental Authority having jurisdiction.

3.7.3.29.4 Design Philosophy

Project Co's Designs and the Detailed Designs shall:

- Meet all functional needs;
- Minimize outages and maintain operation of portions of the Existing Facilities that become part of the Infrastructure; and
- Incorporate flexibility, ease of expansion and ease of maintenance.

3.7.3.29.5 Reference Documents

Project Co shall comply with all of the applicable codes and standards of the following organizations:

- EEMAC;
- CSA;
- NEMA;
- ANSI;
- IEEE; and
- ICEA.

3.7.3.30 Instrumentation and Control and PCS

3.7.3.30.1 General Design Requirements

At a minimum, the design, materials and construction of instrumentation and equipment provided for the control and operation of the Infrastructure shall comply with the applicable requirements and recommendations of the following codes and standards:

- CEC;
- Electrical and Electronic Manufacturers Association of Canada;
- National Electrical Manufacturers Association:
  - ICS 6 Industrial Control and Systems: Enclosures; and
  - ICS 1 Industrial Control Systems General Requirements;
- International Society of Automation;
- Electronic Industries Association/Telecommunications Industries Association (EIA/TIA 606);
- The design of the Infrastructure shall meet the ventilation, extent of classified area, electrical classification, material of construction for Buildings or Structures and Fire Protection measures described in Chapters 4, 5 and 6 of NFPA 820 and follow applicable Good Industry Practice described elsewhere in NFPA 820;
- Underwriters Laboratory, Inc.: 508, Standards for Safety, Industrial Control Equipment; and

- American Petroleum Institute: API RP 551, Process Measurement Instrumentation.

3.7.3.30.2 Additional Instrumentation and Control Design Requirements

Project Co's design shall address the following:

- **Operator Interface Terminals:** The PCS shall be provided with local panel-mounted operator interface terminals such that an operator can fully control and monitor all process area in case of failure of the control room HMI work stations.

- **HMI System:** The HMI system shall consist of servers and workstations to provide control and monitoring of the process, historical trending, reporting and alarming of the PCS for the Infrastructure. All operator workstations shall have the same HMI graphics for full control and monitoring of the entire Infrastructure and have security to prevent unauthorized process changes. The HMI system (i.e. SCADA) shall include one read-only workstation for exclusive use by the City. This workstation shall have the same monitoring and reporting functionality and the same applications (graphics, trends, reports, etc.) as the operator workstations but shall utilize a read-only client license which prevents control capability. This City monitoring/reporting workstation shall have secure remote access capability to allow the City to monitor outside of plant property. The HMI system shall include servers for data polling and the historian, installed in a server rack located in an air conditioned server or communications room. The system shall be designed in a redundant manner such that failure of one server or workstation does not impact the ability to monitor and control the plant, nor record historical data. The system shall include a report printer and an audible alarm to alert operators to alarm conditions.

- **Historian:** The historian server shall provide a plant-wide historical report generation resource. The historian shall maintain historical records of all process I/O, including analog and critical discrete signals, alarms, elapsed time meters for motors, operator actions and trend reports. All data held by the historian shall be maintained in at least one form of automatic redundancy/backup system.

- **Expansion:** All equipment furnished shall accommodate a 20 percent growth for future expansions, including I/O cards, HMI graphic displays, data base and reporting. All equipment provided shall be able to modularly accept expansion without the need to replace any component.

- **Response Time:** Communications between the HMI and field device shall be designed such that the time delay between issuing a command from the HMI and the reaction of the associated field device is not more than three seconds. Furthermore, all status information from field devices shall be displayed at the HMI within three seconds of status change.

- **Process Control Panels:** The PCPs shall be located indoors, in the electrical rooms of each building, and shall be provided in NEMA 12 enclosures with thermostatically controlled cooling fans. Field I/O wires shall be terminated at terminal blocks within each PCP. Communications and I/O cards shall be IEEE surge withstand qualified, conform to SAMA – PMC 33.1, have individual D/A and A/D converters per card and have all inputs and outputs optically or galvanically isolated.

- **Surge Protection:** All network cables shall be protected against ground surges due to lightning or switching. Suitable protectors that meet IEEE-472 requirements shall be installed at the each end of all cables leaving the protected environment (same building). The capacitive loading of protectors shall be small to avoid affecting transmission performance, and shall not exceed values for a standard tap. A low impedance heavy duty ground connection is required.

- **Alarm System:** Provide a method of remote alarm monitoring of critical alarm conditions outside of regular business hours.

- **Phone System:** Project Co may use any part of the existing phone system infrastructure included in the Existing Facilities. Project Co shall coordinate with the City to transfer from the existing City phone service (provided by SaskTel) to a new phone service.

- **2-Way Radio System:** Project Co may use the existing 2-way radio communication system included in the Existing Facilities that is currently maintained by the Regina Police Service. Project Co shall provide the handheld radio units to be used with the system. Project Co shall coordinate with the City to program the 2-way radio system.

- **Communication with City:** Project Co may use the existing radio communication link included in the Existing Facilities for communication between the Infrastructure and McCarthy Boulevard pumping station. The radio link is located on a communication tower at the existing administration building. If Project Co decides not to use the existing radio link, Project Co shall provide an alternate method of communication with the City. Project Co will not be permitted to use the existing microwave link that is currently used to connect to City servers.

- **Communication with End-Users:** A radio link exists within the Lands for communication between the Existing Facilities and End-Users, specifically the End-Users connected to the forcemains upstream of the Infrastructure Diversion Chamber and specifically excluding the GTH pumping station. The radio link is located on a communication tower at the blower building. The radio link will be operated and maintained by the City, however, Project Co may decommission and/or demolish the radio link if required as part of Project Co's Designs and Detailed Designs.

- **Acceptance Testing:** Provide factory acceptance testing and site acceptance testing of the PCPs and PCS. Provide factory acceptance testing and site acceptance testing test plans prior to scheduling the execution of acceptance testing. Provide instrument calibration reports.

- **Communication Network:** Provide a design to ensure that a single point of failure does not disrupt the communication network.

3.7.3.31 Mechanical

The following are the design codes and guidelines for the design and construction of the HVAC, plumbing and fire protection systems for the Infrastructure.

3.7.3.31.1 General Design Codes

New construction, renovations/upgrades shall comply with the Canadian building codes for all aspects of the design. These codes include the following:

- NBCC;
- National Plumbing Code of Canada;
- National Fire Code of Canada; and
- All associated Saskatchewan amendments to the national codes.

3.7.3.31.2 Other Mechanical Design Codes

The mechanical design shall comply with the following regulations and guidelines:

- CEC;
- Requirements of the Water Security Agency of Saskatchewan;
- The design of the Infrastructure shall meet the ventilation, extent of classified area, electrical classification, material of construction for Buildings or Structures and Fire Protection measures described in Chapters 4, 5 and 6 of NFPA 820 and follow applicable Good Industry Practice described elsewhere in NFPA 820;
- ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality; and
- OH&S.

The above list of regulations and guidelines, at a minimum, shall be used to establish ventilation rates and incorporate Good Industry Practice for the control of potential hazardous gases to protect personnel and promote durability of structures and equipment.

The following lists are other codes, standards or guidelines that shall be incorporated into the design where applicable:

- National Energy Code of Canada for Buildings;
- CSA B149.1 – Natural Gas and Propane Installation Code;
- CAN/CSA B214 – Installation Code for Hydronic Heating Systems;
- CAN/CGA B149.6 – Code for Digester Gas and Landfill Gas Installations;
- ASHRAE Handbooks, Standards and Guidelines (or sections thereof);
- SMACNA Sheet Metal and Air Conditioning National Association Publications and Guidelines;
- American Society of Plumbing Engineers Data Book;
- American Conference of Governmental Industrial Hygienists Industrial Ventilation – A Manual of Recommended Practice;
- International Safety Equipment Association ANSI/ISEA Z358.1, American National Standard for Emergency Eyewash And Shower Equipment; and
- OH&S.

3.7.3.31.3 Additional Mechanical Design Requirements

Project Co's design shall address the following:

- **Excess Biogas**: Biogas venting to the atmosphere is prohibited.
- **Room Pressurization**: Part of the requirements from Governmental Authority documents is proper room pressurizations. Cleaner areas are to be positively pressurized relative to dirtier areas to prevent the migration of the dirty air into the cleaner area.
- **Ventilation Effectiveness**: Provide air distribution in rooms in accordance with Good Industry Practice.
- **Emergency Eyewash and Showers**: Provide properly plumbed and drained emergency eyewash and showers with tempered water in accordance with OH&S and the requirements of any applicable Governmental Authority.
- **Material Selection**: Provide durable design by incorporating appropriate materials selections such as corrosion resistant materials and equipment coatings. Equipment shall be easy to clean and water resistant with smooth surfaces (i.e.

- **Heating/Cooling**: Provide heating and cooling to meet requirements of the mechanical design codes, Applicable Law and any Governmental Authority, at a minimum taking into account heat rejection from mechanical and electrical equipment.

- **Explosion Proof Requirements**: Equipment and components shall be selected to satisfy the room classification requirements.

- **Noise and Vibration Control**: Provide adequate noise control with quiet equipment selections and adequate use of noise control equipment (e.g. silencers and acoustic panels) in accordance with Section 3.6.3. Floor mounted equipment shall be placed on house-keeping pads and properly secured. Equipment shall be equipped with adequate use of expansion joints and vibration isolation components.

- **Commissioning**: Incorporate functional commissioning into construction to ensure all installed systems operate as intended.

- **Control System**: The HVAC control system (e.g. BMS) shall be compatible with any existing equipment or structures employed as part of the Infrastructure and shall relay alarms to plant PCS. Control system shall have trending capabilities and be web-accessible to improve troubleshooting capabilities.

- **Biogas Piping, Appurtenances and Burners:** Any existing biogas piping, appurtenances and waste gas burners that do not comply with CAN/CGA B149.6 shall not be reused in the Infrastructure. Provide a minimum of 1 full redundant waste gas burner system.

- **Gas Piping in Tunnels:** Biogas or natural gas piping shall not be directed through the inside of tunnels or equipment galleries and any existing piping shall be relocated. Biogas and natural gas piping required in these areas to service equipment shall only be permitted for use if directed to/from exterior or foundation walls in short direct runs.

3.8 CONSTRUCTION REQUIREMENTS

3.8.1 Preamble

Project Co shall be responsible for the supply of all management, professional and technical services, supervision services, construction quality control and quality assurance services, labour, materials and equipment for performing all of the duties and obligations necessary for delivering all of the requirements of the Project. Project Co is responsible for complying with all legal requirements including, but not limited to, obtaining and complying with requirements of all Applicable Law, Standards and Guidelines and Permits and Approvals.

Project Co shall ensure that construction conforms to the requirements of the design. All construction is to reflect a high degree of workmanship and all materials utilized must meet long-term safety, durability and functionality requirements.

3.8.2 Representatives

Project Co shall appoint a representative (the "**Project Co Construction Representative**") for the Construction Period and shall notify the City of such appointment not less than 10 Business Days before any construction work is commenced.

The Project Co Construction Representative shall be the person responsible for all communications with the City regarding the Works.

The City shall appoint a representative (the "**City Construction Representative**") for the Construction Period and shall notify Project Co of such appointment within 10 Business Days of receipt of Project Co's notice of appointment.

The City Construction Representative shall be the person responsible for all communications with Project Co regarding the Works.

The Project Co Construction Representative and the City Construction Representative may appoint alternatives to serve in addition to, or temporarily in their place, or may delegate some of the functions of such representatives.

Project Co shall not rely upon any acts, omissions, requirements or directions of the City Construction Representative or any other person whatsoever as authority for any departure from the requirements of the Agreement.

3.8.3 Construction Meetings

The Project Co Construction Representative shall schedule and coordinate the following meetings with the City Construction Representative and the Project Co O&M Representative, as required, until Final Completion, if required:

- Weekly construction progress meetings; and
- Weekly commissioning and start up progress meetings.

The purpose of these meetings is to review personnel assignments, responsibilities, administrative and procedural requirements and to obtain updates on construction and commissioning progress. The Project Co Construction Representative shall also coordinate location, attendees and agenda with the City Construction Representative.

3.8.4 Applicable Law and Standards and Guidelines

In all aspects of the Works, Project Co shall comply with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals and Good Industry Practice.

Project Co shall comply with all safety requirements as contained in the regulations as issued under authority of the OH&S.

Project Co shall pay all fees in connection with Workers' Compensation and comply with all requirements of *The Workers' Compensation Act* (Saskatchewan).

3.8.5 Protection to the Public and Fire Safety

Project Co shall ensure that at all times during the Construction Period and the Operating Period, construction activities on the Lands comply with requirements of the NBCC, the Saskatchewan Fire Code Regulations, the OH&S, the *Occupational Health and Safety Code* and any Applicable Law related to public and fire safety.

3.8.6 Surveys, Limits of Construction, Signage and Construction Photographs

3.8.6.1 Surveys

Project Co shall obtain all of the required topographical engineering and legal survey(s) of the Lands where the construction is going to be undertaken. This work includes surveys needed to establish and maintain benchmarks, establish the limits of construction, make measurements to verify the location of existing construction and all legal surveys required during and after any construction undertaken.

The field engineering survey services shall measure and stake the Lands, verify existing conditions, lay out the work for construction, obtain as-built information and obtain measurement of quantities (if required). Project Co shall be responsible for establishing the subsurface conditions based on both Lands and geotechnical investigations.

Project Co shall be responsible for location, confirmation, protection and preservation of control points during construction.

3.8.6.2 Limits of Construction

The Existing Facilities are described in Schedule 7 (Existing Facilities) and the Lands are described in Schedule 12 (Lands). Project Co shall provide adequate worker training, flagging, staking and monitoring to ensure that the limits of construction are observed in the field.

Project Co shall accomplish the construction work using only the area designated for such work. Any construction or commissioning activities outside of the designated construction areas shall be subject to the controls set out in the Construction Period Interface Plan.

Project Co shall not use areas outside the Lands for construction activities, for material/equipment storage or to move equipment through, unless accepted in writing in advance by the City or any other Governmental Authority having jurisdiction.

Project Co shall not partially or completely block the access road to the Lands at any time unless prior written acceptance from the City or any other Governmental Authority having jurisdiction is obtained. Project Co is responsible for maintaining the work access during the Project. Maintenance involves any required repairs to damaged or settled areas during the work.

Project Co shall be responsible for daily inspection and maintenance of the Lands to avoid any damage to the Lands. Project Co shall instruct its personnel, any Project Co Parties, manufacturer's representatives and any other personnel who visit the Lands, on the exposure with wildlife, construction elements, water, wastewater, sludge, solids, radiation and chemicals and any other hazards that may be present on the Lands.

Project Co shall provide, install and maintain all measures required to secure the construction areas during construction.

3.8.6.3 Signage

3.8.6.3.1 Signage prior to Substantial Completion

Project Co shall provide four identical project identification signboards, fabricated and lettered as indicated by the City. Project Co shall review signage details with City prior to the installation of any signage.

Project Co shall set project identification signs plumb and level, at locations to be advised by the City. All information signs must be erected on ground mounted poles or temporarily attached to structural surfaces. No signs may be erected other than those specified. Erection of new signs requires prior written approval of the City.

Project Co shall maintain specified signs for the duration of the Construction Period and remove them from Lands when the construction has been completed or when otherwise directed by the City.

Project Co shall install appropriate signage throughout the Lands identifying construction and construction traffic areas including, but not limited to, the following:

- Route closures and appropriate detour routes;
- Gate closures;
- Redirection of traffic for incoming visitors and construction related deliveries;
- Internal traffic revisions required to avoid interfering with construction-related activities;

- Parking changes;
- Any other signage Project Co considers necessary to minimize the impact of construction-related activities; and
- Warning, traffic directing and other information signs must be painted signs with painted lettering, or standard manufacturer's products.

3.8.6.3.2 Signage after Substantial Completion

Upon Substantial Completion, Project Co shall provide and install a permanent plaque or sign at a fixed location on the Lands, which bears an appropriate inscription, as advised by the City, indicating the provision of funding by PPP Canada Inc. and/or the Government of Canada. Project Co and the City will conduct a joint review during the Construction Period to clearly identify the required signage details.

3.8.6.3.3 Construction Photographs

Project Co shall retain a professional photographer to take photographs throughout the Construction Period and provide a digital album with monthly construction photos showing the progress of the Works throughout the Construction Period and all photos are to be labeled with the date, location and description of the work.

At a minimum, the professional photographer shall take 12 high-definition photographs from the selected vantage points at monthly intervals throughout the Construction Period. Project Co and the City will conduct a joint review prior to any construction activities to clearly identify the selected vantage points.

3.8.7 Coordination and Management of Construction Work

Project Co shall coordinate with the City all construction activities, especially those activities that may affect End-Users.

Project Co shall submit to the City, no later than 2 weeks before commencement of any End-User related interface activity, a detailed work plan, including procedures, roles and responsibilities, hazard/risk analysis, contingences and timelines. Construction activities that require the temporary shutdown of service to the End-Users shall be subject to the City's approval, acting reasonably and following Good Industry Practice. Project Co shall obtain a formal notice to proceed from the City prior to the commencement of such construction activities in accordance with the work plan. The City has the authority to withdraw a notice to proceed at any time, including before and during a planned shutdown, if the City determines that the operational situation has changed, including, for greater certainty, as a result of the occurrence of a wet-weather event, so that the City is required to restore the service to the End-Users. Upon the withdrawal of a notice to proceed in accordance with this Section 3.8.7, Project Co shall use commercially reasonable efforts to restore the service to the End-Users as soon as possible.

3.8.7.1 Project Co's Construction Schedule

Project Co's Construction Schedule is contained in Schedule 2 (Project Co's Construction Schedule).

Project Co's Construction Schedule shall outline the design and construction activities in a sufficient level of detail to enable the City to readily interpret the schedule and facilitate monitoring of the Works progress including:

- Commencement date;
- payment of the Milestone Payment;
- Substantial Completion;
- Identification and a concise description of the major activities, key tasks and milestones to be undertaken during the Works;
- Permits and Approvals dates planned and required;
- Submittal and review dates for Project Co's Management Plans and Systems required for the Project;
- Submittal and review dates for Project Co's Management Plans and Systems required prior to Substantial Completion;
- Submittal dates for Project Co's Management Plans and Systems required for the Existing Facilities O&M;
- Transfer Date;
- Key Construction Period Public Communication Plan activities including open-houses;
- Submittal dates for various draft and final O&M Manuals;
- Detailed Designs package submittals;
- Key activities for achieving external accreditation of the Quality Management System and the Environmental Management System;
- Anticipated construction start date(s);
- Major construction completion milestone dates for each discrete section of the Infrastructure;
- Milestones for the purchase of major equipment items and key subcontracts;
- Equipment installation;

- Staff training;
- A breakdown of long duration activities and sub-activities, which are continuous, repetitive or sequential in nature;
- For the Construction Period, a listing of all key tasks and milestones related to the major design component that addresses any related studies, investigations, surveys, consultation with key stakeholders, public communication tasks, and approvals and permits to be obtained;
- All major tie-in and connection activities to be carried out under the Construction Period Interface Plan;
- Milestone dates for all commissioning and startup activities including the Hydraulic Capacity Tests, the Liquid Stream Treatment Performance Test, the Odour System Performance Test and the 30-Day Performance Test;
- Start and finish dates for all demolition and decommissioning activities, including post Substantial Completion activities; and
- Final Completion.

Project Co's Construction Schedule shall include:

- A separate horizontal bar for each activity of sufficient size to clearly indicate all required information;
- Time divisions into months, weeks and days identifying first work day of each week;
- Start and completion dates for each activity; and
- Projected percentage of completion for each activity as of first day of each month.

Subject to Section 6.5 of the Agreement, Project Co's Construction Schedule shall be amended and updated by Project Co as the Works progress at least monthly. Project Co shall:

- Keep Project Co's Construction Schedule up-to-date for the duration of the Construction Period;
- Indicate actual progress of work against the baseline in Schedule 2 (Project Co's Construction Schedule);
- Revise projections of progress and completion as required; and
- Revise and resubmit Project Co's Construction Schedule at least monthly or as otherwise required by the City.

3.8.7.2 Field Offices

Project Co shall provide and maintain, during the Construction Period, a suitable office on the Lands, for its own use, with suitable tables or benches for the examination of drawings, specifications and other required office equipment, and where all notices and instructions from the City may be received and acknowledged. A meeting space for a minimum 15 persons with chairs and table space for meetings shall be provided.

Project Co shall provide and maintain three suitable offices for exclusive use by City each with the following features:

- Separate access from outside or corridor;
- Minimum size to be 12.6m^2;
- Furnished with a desk, 3 chairs, one drawer file cabinet, plan table (minimum size 900 mm by 1200 mm), plan rack, shelves, waste basket and coat rack;
- Equipped with one telephone line (including handset) and one computer line that has access to a high speed broadband connection;
- Access via wireless or hardwired to colour printer near office;
- Access to photocopier near office;
- Access to washroom facilities near office; and
- Furnished with an adequate heating, ventilation and lighting.

The office shall be secured by lock and key and acceptable to the City acting reasonably and access shall be provided during normal working hours. Project Co shall provide three parking spots designated for use of the City.

3.8.7.3 Verification of Underground Utility Locations

Project Co shall identify and verify the existing underground utility locations prior to commencing any excavation work. Project Co is responsible for potholing, hand exposing and other measures to confirm the locations of all underground utilities for design and construction purposes. Once the utilities are located, Project Co shall exercise due caution to prevent damage to the utilities during the construction work.

Project Co shall be responsible for all tie-points and connections of utility services from the existing pipelines as required for the Works. This responsibility includes paying all associated fees and costs for coordination, construction and inspections with the municipalities and the utility companies, whether the work is to be carried out by Project Co or the utility.

3.8.7.4 Acceptable Days and Hours of Construction

The construction schedule shall satisfy all seasonal and timing restrictions imposed by all relevant Governmental Authorities.

Project Co shall ensure that the property and premises adjacent to the Lands are accessible at all times during the Construction Period.

3.8.7.5 Lands Maintenance

Project Co shall take all precautions, provide all programs and take all actions necessary to protect the Lands, the Existing Facilities and all public and private property and facilities located within or adjacent to the Lands from damage.

Project Co shall provide barricades, fences, lights, warning signs and danger signals and must take other precautionary measures for the protection of persons or property and of the Infrastructure when performed on or adjacent to any roadway, right-of-way or public place.

Facilities that are temporarily removed to facilitate the construction or installation of the Infrastructure must be replaced and restored to their original condition by Project Co.

Project Co shall provide all labour and materials to construct subsurface pipes for water, sewer, recycled water, stormwater drainage, electrical and control conduits, and connect existing utilities to the utilities required for the work including potable water, electricity, natural gas, telephone, cable and other utilities.

Project Co shall provide submetering for any utilities and services used for construction activities and not required for the Existing Facilities O&M.

Project Co shall install, operate, maintain and pay for the provision of all services of all temporary utilities as required during the Construction Period. Temporary utilities shall include:

- Temporary sanitation facilities;
- Required clean water supply for construction activities;
- Temporary light and power;
- Temporary heating;
- Telephone;
- Excavation dewatering; and
- Any other temporary utility that may be required by Project Co during the Construction Period.

Project Co shall be responsible, at its own cost, for:

- Any modification, relocation and re-connection of all the utility services, including water, sanitary services, storm sewer, natural gas and electrical power;

- Any modifications or relocations of existing street lighting, communication lines and fire hydrants; and

- Repairs or replacement of existing roads, curbs gutters, sidewalks and portions thereof.

Project Co shall repair all damage caused to existing roads, curbs, gutters and sidewalks, whether on or outside of the Lands, arising as a result of the construction activities.

3.8.7.6 Traffic Management

Project Co shall develop, implement, maintain, monitor, update and manage, during the Construction Period, traffic management plans and procedures for the Lands as a part of the Construction Management Plan.

Project Co shall maintain the safe and efficient passage of traffic on existing roadways within the Lands. If Project Co needs to truck haul materials over roads that are not designated as truck haul roads by Applicable Law or the Governmental Authority having jurisdiction, Project Co shall be responsible for obtaining written acceptance from the Governmental Authority having jurisdiction and the City for use of proposed haul routes within their respective jurisdictions

If Project Co requires a new access road for construction purposes, Project Co shall obtain necessary Permits and Approvals from any applicable Governmental Authority.

3.8.7.7 Landscape Protection and Lands Restoration

Project Co shall protect existing trees, shrubs and plants on or adjacent to the Lands that are shown or designated to remain in place against unnecessary cutting, breaking or skinning of trunk, branches, bark or roots. It is Project Co's responsibility to implement landscape and Lands restoration management plans in the areas where the construction is undertaken.

3.8.7.8 Clearing, Excavation and Soils Disposal Including Contaminated Soils

Project Co shall perform all clearing and grubbing of the Lands necessary for the construction activities during the Construction Period as required for the Works, including the removal and disposal of rocks, stumps, trees, roots, abandoned construction material, surface structures and pipes and unsuitable soil materials.

Project Co shall perform operations in connection with excavation of materials, regardless of the character of that material, and backfilling necessary for the construction of the Infrastructure, including furnishing all supervision, labour, tools, materials and equipment in connection therewith. Any excavation and backfilling activities, including fill and backfill material, compaction, subgrade preparation and stabilizing, shoring and dewatering methods, shall be approved by a Professional Engineer specializing in soil mechanics.

Project Co shall obtain all fill, backfill, topsoil and other required materials to achieve final grade lines and complete the work. Backfill materials shall only consist of suitable clean soil. All materials shall be tested for conformance with the design and approved by a Professional Engineer specializing in soil mechanics.

Project Co shall take appropriate action when soils are not suitable for sustaining design loads according to established codes and accepted engineering practices.

Backfill shall not be placed against concrete walls until the structure has obtained sufficient strength to support loadings from backfilling operations, backfill and other construction loadings. In addition, water-retaining structures shall pass leakage tests before backfilling in accordance with ACI 350.1-10 Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures.

Project Co shall test all soils to be disposed of off the Lands for contaminants in accordance with minimum requirements established by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals and the landfill selected by Project Co for disposal.

Project Co shall maintain a record of the disposed soils and provide a copy to the City.

Contaminated soils shall be separated from the rest of excavated material and removed, tested, and disposed by Project Co in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. Construction workers involved in any excavation work of contaminated soils must have the necessary safety training and experience requirements required by the OH&S. Project Co may dispose un-contaminated soil in the borrow pit located east of the primary treatment building, or elsewhere on the site, as appropriate.

3.8.7.9 Shoring and Dewatering

Project Co shall provide all dewatering services as required to facilitate construction of below grade structures that may be in the water table.

Project Co shall be responsible for the design, planning, installation, maintenance and removal (if necessary) of all shoring required to support the sides of any excavation and all other measures to prevent settlement of surrounding areas or any movement that may damage adjacent facilities, delay the work or endanger life or health.

Project Co shall establish settling monitoring when excavating activities are undertaken adjacent to existing structures that will be maintained.

The shoring method to be established is solely the responsibility of Project Co and the shoring system shall comply with any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. The shoring system shall be designed by a Professional Engineer.

Project Co shall provide all work and equipment necessary for temporary drainage and pumping systems required to keep open basements, excavations and the Lands free from accumulations of water.

Project Co shall ensure that all water removed from excavations is disposed of in a manner to prevent flooding, erosion and property damage and in accordance with any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals and shall not discharge to the sanitary sewer any such water removed from excavations.

3.8.7.10 Abandoned Pipe

Project Co shall obtain all required Permits and Approvals regarding abandoned pipe required by any applicable Governmental Authority, Applicable Law and Standards and Guidelines.

3.8.7.11 Demolition, Salvage and Disposal

Project Co shall be responsible for demolition required for the Works and the disposal of all demolition and construction debris and equipment at appropriately permitted facilities and as required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals. All demolitions shall be conducted under the requirements established in the OH&S. The completion of all demolition and decommissioning activities shall be a prerequisite of Final Completion.

3.8.7.12 Temporary Sludge Storage Area

After Project Co has received written authorization from the City to commence disposal, Project Co shall be responsible for the disposal of biological sludge and Inorganic Sludge in a Working Cell.

After removal and disposal of the stock piles, Project Co shall remove and dispose of the temporary berm and restore the surrounding topography to natural elevations.

The complete removal and disposal of biological sludge and Inorganic Sludge from the Temporary Sludge Storage Area shall be a condition of Final Completion

3.8.8 Management of Water and Sanitation Facilities during Construction

Project Co shall follow at least the minimum requirements for managing surface water and storm water on the Lands during construction as required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals. Project Co shall comply with minimum requirements for managing sanitation facilities during the Construction Period.

3.8.8.1 Sources of Construction Water

Project Co shall provide for the detention and discharge of all water generated during construction. Construction water includes surface water runoff and water removed from

excavated areas. Project Co shall schedule all construction activities to minimize the amount of construction water to be managed in a given period.

Where required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals or Good Industry Practice, Project Co shall provide adequate treatment of any groundwater discharged to Wascana Creek as a result of the Project.

3.8.8.2 Temporary Drainage Features

Project Co's Designs and the Detailed Designs shall include standards, specifications and design methods that will be implemented during the Works with respect to proposed drainage facilities. Specific items to be addressed in Project Co's Designs and the Detailed Designs shall include:

- storm management facilities;
- storm sewers;
- open ditches;
- canals;
- catch basins;
- third-party drainage arrangements;
- sub-drainage;
- erosion control features; and
- area drainage plan.

Project Co shall identify and provide details for all off-lands drainage arrangements that relate directly or indirectly to the Infrastructure. Project Co shall describe the methodology and approach employed for the design of the drainage facilities required for the Infrastructure. Project Co shall provide the factors, parameters and assumptions used in the derivation of the design flows and other drainage analysis.

3.8.8.3 Surface Water Quality and Stormwater Permit

Project Co shall implement measures to prevent the contamination of surface water through stormwater runoff. Project Co shall employ all necessary measures required to comply with any stormwater Permits and Approvals.

Project Co shall install and maintain adequate drainage to prevent soil erosion at construction areas during the Construction Period.

Project Co shall implement and maintain best management practices at all times. Temporary erosion control and protection measures must be in place at all times during the Construction Period and must be routinely inspected. As permanent drainage structures are installed, Project Co shall protect intakes to avoid plugging.

Project Co shall monitor and maintain the effectiveness of the runoff protection at all times.

3.8.8.4 Groundwater

Project Co shall establish the existing groundwater conditions from the available geotechnical reports and by conducting such investigations as Project Co deems necessary. Project Co shall ensure the protection of groundwater from contamination during construction as set out in the Construction Management Plan.

Project Co shall ensure that dewatering discharge generated during construction activities is not discharged to the stormwater system without adequate treatment. Disposal of water removed during construction activities must be conducted in a manner that prevents flooding, erosion, property damage and turbidity or sediment contamination of surface waters.

Project Co shall comply with the aquifer protection requirements of the City of Regina Bylaw 9250.

3.8.8.5 Surface Water Management Monitoring

Project Co shall conduct continuous monitoring of surface water during the Construction Period in accordance with the procedures set out in the Construction Management Plan to avoid surface water contamination.

3.8.8.6 Sanitation Facilities

Project Co shall provide and maintain during the Construction Period, temporary toilets on the Lands for the use of construction personnel employed on the Project. Upon completion of construction activities, Project Co shall remove the temporary sanitation facilities.

3.9 COMMISSIONING, STARTUP AND TESTING TO ACHIEVE SUBSTANTIAL COMPLETION

3.9.1 Project Co's Commissioning and Startup Activities

The commissioning and startup testing activities shall be carried out by Project Co in accordance with the Commissioning and Startup Plan. The commissioning and startup testing activities include dry tests, wet tests, Hydraulic Capacity Tests, the Liquid Stream Treatment Performance Test and the Odour System Performance Test. These testing activities shall be executed on the Infrastructure as described below.

The minimum requirements and sequence of each of the commissioning and startup testing activities are summarized below:

- Dry and wet testing: both dry and wet tests shall be carried out on each piece of equipment and sub-system and to confirm that the process, mechanical, electrical, control and other components of the Infrastructure are correctly installed in compliance with Project Co's Designs and the Detailed Designs;

- Hydraulic Capacity Tests;

- Liquid Stream Treatment Performance Test; and

- Odour System Performance Test.

The detailed testing processes, procedures, sequence and schedule to demonstrate the ability of the Infrastructure to meet the Technical Requirements shall be set out in the Commissioning and Startup Plan. General requirements of the startup, commissioning and testing are further described below.

3.9.1.1 Dry And Wet Testing

All process, mechanical, electrical, control and any other equipment related to the Infrastructure shall be dry and wet tested to demonstrate that they are successfully installed in full compliance with Project Co's Designs and the Detailed Designs. This stage of testing must be completed on each piece of equipment, sub-system and system prior to that component of the Infrastructure being placed in service.

Any part of the Existing Facilities that forms part of Project Co's Designs and the Detailed Designs shall be tested as part of the dry and wet testing phase to demonstrate that it can meet the duty and performance requirements of the Technical Requirements.

3.9.1.2 Dry Testing

Project Co shall carry out dry testing of the Infrastructure to the extent possible before introducing flows into the Infrastructure. Dimensional, alignment, piping connections and electrical connections and equipment and control system functionality shall all be verified.

Project Co shall obtain the assistance of the supplier's representatives to demonstrate that the equipment is properly installed.

3.9.1.3 Wet Testing

Wet testing shall be completed in two stages.

In the first stage, equipment shall be run for a short period, either individually or as complete sub-systems or systems, as appropriate. During this first stage, local controls shall be satisfactorily verified by cycling the equipment through several start-stop operations and modulating its output, or a combination thereof. Operating parameters such as temperature, pressure, voltage, vibration and any other applicable supplier or design criteria shall be checked

to ensure they are consistent with Project Co's Designs and the Detailed Designs and the supplier's recommended limits, as appropriate.

In the second stage, process systems shall be restarted and run continuously for a minimum of seven days in automatic control. During this second stage, as far as practicable, conditions shall be simulated which represent maximum or most severe, average, and minimum or least severe conditions as defined by Project Co's Designs and the Detailed Designs. In the event that it is not practical to simulate automatic control and operate process systems continuously for a minimum of seven days, Project Co shall propose an alternate means of testing such equipment.

The test conditions shall be as set out in the Commissioning and Startup Plan, and shall be determined so as to ensure that the wet testing properly verifies the performance of the Infrastructure in accordance with Project Co's Designs and the Detailed Designs.

The seven day wet testing of individual systems may be conducted either concurrently or in sequence as is practicable and as set out in the Commissioning and Startup Plan.

In the event that any of the seven day wet tests are terminated before completion or are unsuccessful, then that test shall be repeated in its entirety.

3.9.1.4 Hydraulic Capacity Tests

The capability of the Infrastructure, including tanks, pumps, all equipment, conduits, piping, wet weather flow equipment, to successfully convey the flows and meet the Design Capacity defined in Section 3.4 and in accordance with Project Co's Design and Detailed Designs shall be demonstrated during the Hydraulic Capacity Tests, which will be performed after dry and wet testing are complete for components of the Infrastructure related to each such Hydraulic Capacity Test. Project Co shall plan and conduct the tests so as to ensure that the systems are subjected to the Design Capacity flows and in accordance with Project Co's Design and Detailed Designs.

The Hydraulic Capacity Tests shall also demonstrate that the Infrastructure functions in accordance with the key hydraulic parameters of Project Co's Designs and the Detailed Designs. Where necessary to achieve the Design Capacity flows for the Hydraulic Capacity Tests, either individual trains or facilities with multiple identical trains can be utilized with proportional flows and/or the flows shall be augmented using temporary equipment to simulate the Design Capacity flows. Where it is necessary to modify settings or utilize temporary equipment outside the limits of the Infrastructure, such modifications must be coordinated with the City. If the number of hydraulic components in service is varied to demonstrate the performance of the system at the design flows, Project Co shall repeat the test for each hydraulic component until all components in the system have been tested in accordance with the key hydraulic parameters of Project Co's Designs and the Detailed Designs.

The Hydraulic Capacity Tests shall be successfully completed prior to the Liquid Stream Treatment Performance Test and the 30-Day Performance Test. If the Hydraulic Capacity Tests are terminated before successful completion, the testing shall be repeated in its entirety for components of the Infrastructure related to each such Hydraulic Capacity Test. Testing shall

demonstrate the ability to covey the Design Capacity flows and in accordance with Project Co's Designs and the Detailed Designs for a minimum of a 1-hour period.

3.9.1.5 Liquid Stream Treatment Performance Test

The Liquid Stream Treatment Performance Test shall be performed after the Hydraulic Capacity Test to demonstrate the Liquid Stream Treatment portion of the Infrastructure meets the Effluent Standards. Notwithstanding an extension from the Water Security Agency of Saskatchewan on the compliance date for total nitrogen and total ammonia nitrogen, the Liquid Stream Treatment Performance Test shall demonstrate that the Infrastructure meets the Effluent Standards for total nitrogen and total ammonia nitrogen compliance as contemplated in Project Co's Designs and the Detailed Designs.

The Liquid Stream Treatment Performance Test shall also demonstrate that the Infrastructure meets the key parameters of Project Co's Designs and the Detailed Designs and can operate reliably for a minimum of 14 consecutive days and no greater than 30 consecutive days without Unplanned Maintenance or any other unplanned operator intervention. Project Co shall plan the Liquid Stream Treatment Performance Test to ensure that the Infrastructure is subjected to the quantity and quality of Raw Wastewater received at the Infrastructure at the time of testing. Where compliance with Effluent Standards is based on monthly averages, the Liquid Stream Treatment Performance Test shall be calculated based on the average of the test period results.

The Infrastructure shall be placed into the final configuration and shall be in full service prior to the commencement of the Liquid Stream Treatment Performance Test. All components and systems shall be operated in automatic mode to prove proper operation of the PCS.

The O&M of the Infrastructure during the Liquid Stream Treatment Performance Test shall follow operating procedures and protocols in the Operation and Maintenance Plan and the O&M Manuals.

The Treated Wastewater testing requirements for the Liquid Stream Treatment Performance Test, shall at a minimum include the categories and frequencies of analysis required for the O&M, augmented as required by additional sampling and analysis to demonstrate that the Infrastructure meets the key parameters of Project Co's Designs and the Detailed Designs. The Raw Wastewater and Treated Wastewater shall be regularly monitored for all design and performance requirements, parameters and criteria specified in Section 3.4.

All Treated Wastewater sampling and analysis carried out during the Liquid Stream Treatment Performance Test shall be carried out in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan. A split sample of all of the Treated Wastewater samples taken during the test shall be provided to the City for independent analysis if so required.

For greater certainty, Project Co shall not be required to successfully complete the Liquid Stream Treatment Performance Test if the 30-Day Performance Test has been successfully completed prior to Substantial Completion.

3.9.1.6 Odour System Performance Test

Project Co shall demonstrate by field testing that the odour control system(s) treatment efficiencies described in the odour control design development report are met using hydrogen sulphide gas as a surrogate to simulate worst case conditions as set out in the report. Project Co shall provide justification in the Commissioning and Startup Plan for the field testing protocol and confirm that it reasonably reflects worst case odour emission conditions.

Project Co shall undertake field testing over an 8 hour continuous period with inlet and outlet samples collected every 15 minutes. In the event that the actual treatment efficiencies are lower than used in the design development report, Project Co shall rerun the air dispersion modelling based on the actual treatment efficiencies and demonstrate the Odour Criteria specified in Section 3.4.5 are met.

If dispersion modelling demonstrates odour concentrations above the Odour Criteria, Project Co shall undertake all necessary measures, at its own effort and cost, to meet the Odour Criteria. After optimizing the performance of the Infrastructure and/or installing new equipment as may be required, Project Co shall collect samples from emission sources as required and re-run odour dispersion modelling to demonstrate compliance with the Odour Criteria in accordance with protocol described in this section.

3.9.2 Commissioning and Startup Test Monitoring

During the commissioning and startup testing the Treated Wastewater, Residuals and Biosolids, and odour shall be regularly monitored for specific key parameters identified in the Commissioning and Startup Plan to evaluate the performance of the Infrastructure.

The frequency of sampling and analysis conducted shall be equal or greater to that specified in Section 5 for the O&M. All samples shall be analyzed by a certified, independent laboratory that utilizes standard analytical and quality control procedures. The laboratory shall be identified and agreed upon by Project Co and the City prior to testing.

3.9.3 Commissioning and Startup Test Reporting

Project Co shall prepare the commissioning and startup test report and submit the report to the City in accordance with the form set out in the Commissioning and Startup Plan as a condition of Substantial Completion.

The Infrastructure will be deemed to have passed the Hydraulic Capacity Tests, Liquid Stream Treatment Performance Test and Odour System Performance Test if the results for every parameter comply with the Technical Requirements and the test standards and criteria identified in the reviewed Commissioning and Startup Plan in accordance with Project Co's Designs and the Detailed Designs and all components and systems operate successfully throughout the tests in automatic control without any Unplanned Maintenance or other unplanned operator intervention.

The Treated Wastewater, Biosolids and Residuals quality testing must meet the specified quality standards during the performance tests in order for this test to be deemed to have passed.

The commissioning and startup test report shall include, at a minimum, the following information:

- All sampling, analysis and monitoring data measured and recorded pursuant to the Commissioning and Startup Plan including laboratory analysis, chemical consumption, instrument calibration certificates and any relevant calculations based on the data provided;
- All PCS trend data from the Flow Meters and the Pressure Meters;
- All necessary certification relating to the testing, analysis and evaluation;
- A record of all equipment failures, repairs, replacements and maintenance encountered during execution of the Commissioning and Startup Plan;
- Certification stating that all testing was completed in accordance with the reviewed Commissioning and Startup Plan; and
- Certification of the Hydraulic Capacity Tests, the Liquid Stream Treatment Performance Test and the Odour System Performance Test results and a determination of the extent to which the results comply with the Technical Requirements.

Project Co and the City shall meet to review the commissioning and startup test report.

3.9.4 Re-testing

If the Hydraulic Capacity Tests, the Liquid Stream Treatment Performance Test or the Odour System Performance Test results fail to demonstrate compliance with the Technical Requirements and to fulfil the test standards and criteria identified in the reviewed Commissioning and Startup Plan in accordance with Project Co's Designs and Detailed Designs, Project Co shall take corrective actions and repeat such tests, as applicable.

3.9.4.1 As-Built Drawings

As the construction work progresses, Project Co shall maintain a minimum of two duplicate up-to-date sets of design documents, including the design drawings, specifications, equipment vendor drawings and construction drawings. These documents shall be kept up to date with any field measurements and field construction changes and discrepancies on a continuous basis and shall never be more than 14 days behind the current state of the design and construction. The two sets shall be maintained in separate locations such that a disaster shall not jeopardize both sets simultaneously.

Within 9 months of Substantial Completion, Project Co shall submit the following as-built drawings (the "**As-Built Drawings**") to the City:

- Three sets of A1 size drawings and 2 sets of 11x17 (true half-size) drawings and any copies required by any Governmental Authority;
- Electronic AutoCAD and PDF design drawings files; and
- Electronic source file and PDF specification files.

Project Co shall also submit a digital album with monthly construction photos showing the progress of construction throughout the Construction Period and all photos are to be labelled with the date, location and description of the work.

Changes to specifications and appendices shall be on compact discs, modified to clearly and accurately show all changes made during construction. The As-Built Drawings submittal shall also include a complete set of all change orders, numbered and bound in chronological order of issuance.

Project Co shall provide updated As-Built Drawings for the completed Works as a condition precedent to Final Completion.

3.9.4.1.1 Payment Adjustment

If Project Co fails to submit the As-Built Drawings within 9 months of Substantial Completion, a Payment Adjustment of $500 per day will be assessed for each day or part thereof until Project Co submits the As-Built Drawings in the proper form.

3.9.4.2 O&M Manuals

Project Co shall provide the O&M Manuals for the Infrastructure in both electronic PDF and hard copy form.

Project Co shall develop the O&M Manuals for the Infrastructure and systems that are included in the scope of the O&M.

All instruction in the O&M Manuals shall be in simple language to guide the O&M staff in the proper operation and maintenance of the Infrastructure.

The O&M Manuals shall contain the following items as they specifically apply to the Infrastructure:

- System design criteria;
- PCS description and functional design specification(s);
- System and controls schematics;
- Operating instructions, including proprietary equipment manufacturer's printed instructions describing proper operation;

- Equipment list and equipment identification data including name plate information for each piece of equipment;
- Tag listing identifying the tag number and equipment description and location;
- Spare parts list including proprietary equipment manufacturer's recommended spare parts listing for all equipment;
- Supplier and Project Co listing identifying all Project Co Parties and suppliers who supplied and installed the equipment, systems, materials or finishes and including the suppliers' and Project Parties' names, addresses and telephone numbers;
- As-Built Drawings;
- Complete set of the final shop drawings;
- Product data including equipment manufacturer's product data for proprietary equipment, systems, materials and finishes;
- Copies of inspection reports, test reports and other certificates required by the Agreement;
- Copies of manufacturer's warranties, maintenance bonds and service contracts;
- Construction completion and testing reports documenting the performance and the results of the tests required by the Agreement; and
- Any other documentation or information required by the Agreement.

The O&M Manuals, with the exception of the As-Built Drawings, shall be reviewed in accordance with Schedule 5 (Design and Plan Certification Process and Review Procedure) prior to and as a condition precedent to Substantial Completion.

3.10 30-DAY PERFORMANCE TEST

3.10.1 30-Day Performance Test Requirements

The 30-Day Performance Test shall be performed after the Hydraulic Capacity Test to demonstrate Infrastructure meets the performance requirements specified in Section 3. The 30-Day Performance Test may be carried out simultaneously or separately with the Liquid Stream Treatment Performance Test.

The tests shall also demonstrate that Infrastructure meets the key parameters of Project Co's Designs and the Detailed Designs and can operate reliably for a minimum of 30 consecutive days without Unplanned Maintenance or any other unplanned operator intervention. Notwithstanding an extension from Water Security Agency of Saskatchewan on the compliance date for total

nitrogen and total ammonia nitrogen, the 30-Day Performance Test shall demonstrate Infrastructure meets the Effluent Standards for total nitrogen and total ammonia nitrogen compliance as contemplated in Project Co's Designs and the Detailed Designs.

The 30-Day Performance Test shall concurrently test Liquid Stream Treatment and the treatment processes which generate Biosolids or Residuals. Project Co shall vary the number of treatment components in service to demonstrate the performance at higher hydraulic and organic loading rates to demonstrate operation at all design conditions.

The Infrastructure shall be placed into the final configuration and shall be in full service prior to the commencement of the 30-Day Performance Test. During the test, all components and systems shall be operated in automatic mode to prove proper operation of the PCS.

Project Co shall plan the 30-Day Performance Test to ensure that the system is subjected to the maximum design flows and loads set out in Section 3 for at least two 24 hours periods during the 30-Day Performance Test and shall modify the plant configuration and vary the number of treatment components in service as required to simulate these conditions.

The O&M of the Infrastructure during the 30-Day Performance Test shall follow operating procedures and protocols in the Operation and Maintenance Plan and the O&M Manuals.

The Treated Wastewater testing requirements for the 30-Day Performance Test, shall at a minimum include the categories and frequencies of analysis required for the O&M, augmented as required by additional sampling and analysis to demonstrate that the Infrastructure meets the key parameters of Project Co's Designs and the Detailed Designs. The influent quantity and quality, Treated Wastewater, Residuals and Biosolids shall be regularly monitored for all design and performance requirements, parameters and criteria specified in Section 3.4. The frequency of sampling and analysis conducted shall be equal or greater to that specified in Section 3.5 for the O&M.

All Treated Wastewater sampling and analysis carried out during the 30-Day Performance Test shall be carried out in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan. A split sample of all of the Treated Wastewater samples taken during the test shall be provided to the City for independent analysis if so required.

All samples shall be analyzed by a certified, independent laboratory that utilizes standard analytical and quality control procedures. The laboratory shall be identified and agreed upon by Project Co and the City prior to testing.

3.10.2 30-Day Performance Test Reporting

Project Co shall prepare the 30-Day Performance Test report and submit the report to the City in accordance with the form set out in the Commissioning and Startup Plan.

The Infrastructure will be deemed to have passed the 30-Day Performance Test if the results for every parameter comply with the Technical Requirements and the test standards and criteria identified in the reviewed Commissioning and Startup Plan in accordance with Project Co's

Designs and the Detailed Designs and all components and systems operate successfully throughout the tests in automatic control without any Unplanned Maintenance or other unplanned operator intervention.

The Treated Wastewater, Biosolids and Residuals quality testing must meet the specified quality standards during the performance tests in order for this test to be deemed to have passed.

The 30-Day Performance Test report shall include, at a minimum, the following information:

- All sampling, analysis and monitoring data measured and recorded pursuant to the Commissioning and Startup Plan including laboratory analysis, chemical consumption, instrument calibration certificates and any relevant calculations based on the data provided;
- All PCS trend data from the Flow Meters and the Pressure Meters;
- All necessary certification relating to the testing, analysis and evaluation;
- A record of all equipment failures, repairs, replacements and maintenance encountered during execution of the Commissioning and Startup Plan;
- Certification stating that all testing was completed in accordance with the reviewed Commissioning and Startup Plan; and
- Certification of the 30-Day Performance Test results and a determination of the extent to which the results comply with the Technical Requirements.

Project Co and the City shall meet to review the commissioning and startup test report.

3.10.3 Re-testing

If the 30-Day Performance Test results fail to demonstrate compliance with the Technical Requirements and to fulfil the test standards and criteria identified in the reviewed Commissioning and Startup Plan in accordance with Project Co's Designs and Detailed Designs, Project Co shall take corrective actions and repeat such tests, as applicable.

4 EXISTING FACILITIES O&M REQUIREMENTS

4.1 GENERAL

Notwithstanding the specific requirements of this Section 4, Project Co shall ensure that the Existing Facilities are operated and maintained in a manner within their capability that ensures the continuous and uninterrupted delivery of the service.

4.2 EXISTING FACILITIES O&M REPRESENTATIVES

Project Co shall appoint one or more person(s) to serve as representatives in connection with the oversight of the Existing Facilities O&M (the "**Project Co Existing Facilities O&M Representative**") and shall notify the City of such appointment not less than 20 Business Days following the Existing Facilities O&M Effective Date.

The City shall appoint one or more person(s) to serve as representatives in connection with the oversight of the Existing Facilities O&M ("the **City Existing Facilities O&M Representative**") and shall notify Project Co of such appointments within 20 Business Days of receipt of Project Co's notice of appointment of the Project Co Existing Facilities O&M Representative.

The Project Co Existing Facilities O&M Representative and the City Existing Facilities O&M Representative(s) may appoint alternates to serve in addition to, or temporarily in their place, or may delegate some of the functions of their respective representatives.

Project Co shall not rely upon any acts, omissions, requirements or directions of the City Existing Facilities O&M Representative(s) or any other person whatsoever as authority for any departure from the terms of the Agreement.

4.3 PROJECT CO'S RESPONSIBILITIES

Project Co shall be responsible for all aspects of the Existing Facilities O&M, including:

- All labour, materials and equipment required for conducting the Existing Facilities O&M;
- Ensuring the Existing Facilities O&M and the Effluent Standards are maintained in good standing with any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals and EMPA;
- Supplying administration services, computer hardware components and software based applications, on-line data entering, internet connection, accounting, clerical, legal and technical personnel;
- Coordinating with the City to disconnect the City's existing phone service (currently provided by SaskTel);
- If necessary, coordinating with the City to reprogram the existing 2-way radio system currently maintained by Regina Police Service;
- Coordinating with the City on maintaining or modifying the communication links between the Existing Facilities and the McCarthy Boulevard pumping station;
- Coordinating with the City on transferring the existing CMMS database and software to Project Co's computer network;

- Maintaining and updating the Emergency Response Plans and coordinating site evacuation procedure and drills;
- Supplying rolling stock such as trucks, forklifts, graders, maintenance vehicles as appropriate for conducting the Existing Facilities O&M;
- All operations, inspections, maintenance and testing of rolling stock including, but not limited to the supply of all fuels, oils, greases, registration and insurance;
- All inspections and reports required by the Agreement, any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals;
- All maintenance, testing and annual inspections for fire systems including, but not limited to fire extinguishers, fire hoses, sprinkler systems, fire alarms, fire pumps, emergency lights and fire hydrants;
- Completing cleaning, inspections, maintenance and certification of major process equipment, tank, pressure vessels and structures;
- Completing annual testing and inspection of back-flow preventers and pressure regulators;
- Completing monthly inspection and annual load testing of the emergency generator(s);
- Completing inspections, certifications and registrations for boilers and pressure vessels in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;
- Completing the monthly and annual inspections of process blowers;
- Completing maintenance, testing and annual inspections of cranes, lifting devices, and lifting structures in accordance with manufacturer recommendations, any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;
- Responding to wastewater related emergencies including, but not limited to overflows, yard piping breaks;
- Garbage removal and bin rental including recyclable products;
- Grit removal, hauling and disposal;
- Operating, monitoring and maintenance of 24-hour monitoring systems;
- Operating and maintaining all applicable heating, cooling and humidity systems;

- Operating and maintaining the building management and control systems;
- Repair or replacement of equipment;
- Performing all predictive and preventative maintenance;
- Performing property security and ensuring all fencing is secure and maintained;
- Keeping the buildings, the Lands and other operations clean, tidy and safe;
- Supplying all shop supplies including, but not limited to oil, grease, rags, tape, and hardware;
- Supplying and maintaining all operations and maintenance PPE;
- Supplying all personnel operations and maintenance training and certification; conducting all sampling and laboratory testing and analysis required for daily operations, Existing Facility reports and the Effluent Standards;
- Providing all monthly and annual reports as required by the City, any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals;
- Subject to Sections 5.10(e) and 15.1(d) of the Agreement, collection, storage and disposal of Hazardous Substances, including asbestos;
- Supplying all chemicals required including, but not limited to laboratory testing, wastewater treatment and sludge treatment;
- Operating and maintaining the Existing Hauled Waste Receiving Station and City hydrovac truck receiving station;
- Operating and maintaining Digested Sludge dewatering and disposal within the Dewatered Sludge Cake Storage Area;
- Operation and maintenance of Existing Lagoons used for sludge storage including any activities that may be necessary to provide sufficient sludge storage capacity for daily operations;
- Operating and maintaining digesters and associated equipment; and
- Monitoring and maintenance of biological sludge and Inorganic Sludge located at the Temporary Sludge Storage Area.

4.4 OPERATION AND MAINTENANCE OBJECTIVES

Project Co shall provide the Existing Facilities O&M described herein in a professional and diligent manner during the Construction Period. The Existing Facilities O&M shall be performed in a manner and approach that that is consistent with achieving the following Existing Facilities O&M objectives:

- Protecting the health and welfare of the public and the environment;
- Conforming with all OH&S requirements;
- Complying with all Permits and Approvals that may be issued under Applicable Law, Standards and Guidelines and the Effluent Standards;
- Ensuring at all times that there is continuous and reliable service delivered to the End-Users whose systems are connected to the Existing Facilities; and
- Performing all related functions with due regard to the intended use of the Existing Facilities and in keeping with Good Industry Practice.

Project Co shall conduct predictive, preventive and routine equipment maintenance of the Existing Facilities described herein in order to achieve the following overall objectives:

- Ensure the performance of the Existing Facilities is consistent with the expected operating conditions to meet the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, the Effluent Standards and Permits and Approvals;
- Perform predictive and preventive maintenance on all equipment in accordance with recommendations of the equipment manufacturer(s);
- Perform predictive and preventative maintenance in such a manner that the condition and functionality of the Existing Facilities are maintained in good operating condition; and
- Ensure that fully trained and appropriately licensed operators, maintenance, laboratory and qualified support staff are assigned to the Existing Facilities O&M at all times.

4.5 EXISTING FACILITIES O&M REQUIREMENTS

This Section 4.5 summarizes the Existing Facilities O&M requirements.

Project Co shall implement a system of operation to ensure the reliable and effective function of the Existing Facilities.

Project Co's operating system shall be designed to ensure:

- Operation of the Existing Facilities to receive and treat Raw Wastewater from the City and End-Users to the Effluent Standards at all times;

- Operation of the Residuals, sludge treatment, biogas systems, sludge dewatering systems and odour control systems in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals to the extent achievable by the current capability of the Existing Facilities;

- Operation of all equipment and treatment processes in the manner for which they were designed;

- Full Treatment of Treated Wastewater prior to discharge to Wascana Creek; and

- Sludge treatment, dewatering and disposal within the Lands is in accordance with Good Industry Practice.

Project Co shall develop and perform routine, preventive and predictive maintenance procedures for the Existing Facilities, including mechanical, electrical and instrumentation/control equipment.

Project Co shall develop preventive maintenance procedures for all wastewater process units, buildings, structures, piping, housekeeping activities and landscaping activities. The preventative maintenance procedures shall include required maintenance, frequencies of activities, materials, parts and tools.

Tables 4.5A and 4.5B define the influent quantity and quality parameters for the delivery of Raw Wastewater to the Existing Facilities.

Table 4.5A - Existing Facilities O&M Maximum Influent Criteria

Parameter	**Unit**	**Quantity**
Flow		
Monthly average day flow	ML/d	100
BOD5		
Monthly average day loading	kg/d	18,500
Total Suspended Solids		
Monthly average day loading	kg/d	19,100
Total Phosphorus		

Monthly average day loading	kg/d	420
In addition to the influent criteria set out in this Table 4.5A, wastewater pumped from the McCarthy Boulevard Pumping Station will be screened by the City upstream of the Infrastructure Diversion Chamber.		

Table 4.5B - Existing Facilities O&M Minimum Influent Criteria

Parameter	Unit	Quantity
pH		
Minimum week	pH	7.0
Temperature		
Minimum week	Degrees C	10.0

4.5.1 Existing Facilities O&M Measurement, QA/QC and Testing Requirements

4.5.1.1 General

This Section 4.5.1 sets out the minimum requirements for the Existing Facilities performance, measurement, sampling, testing and analysis applicable to the Existing Facilities from the Existing Facilities O&M Effective Date until Substantial Completion.

The City may from time to time and at its discretion collect split samples from the Raw Wastewater and Treated Wastewater. Project Co shall, at all times, provide the City and any applicable Governmental Authority with unimpeded access to the Raw Wastewater and Treated Wastewater sampling devices and any other sampling locations that may be required for confirmation of compliance with the Technical Requirements.

4.5.1.2 Laboratory Accreditation

Project Co shall use an Accredited Laboratory where required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals. Where Accredited Laboratory testing is not required, Project Co may perform the laboratory testing or elect to utilize an external Accredited Laboratory to perform any or all of the analytical testing. All laboratory operations shall be set up, audited and monitored to ensure compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals and the Wastewater Sampling and Analysis Plan.

Testing required for federal effluent reporting shall be conducted by an Accredited Laboratory in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals.

All Existing Facilities laboratory equipment and analytical equipment will be provided to Project Co on the Existing Facilities O&M Effective Date on an "as is" basis. The City provides no representation or warranties with respect to the Existing Facilities laboratory equipment. Project Co shall arrange for independent, certified technicians to perform calibration of the analytical instruments according to the manufacturer's instructions and annually thereafter.

4.5.2 Dewatered Sludge Cake Storage Area Requirements

The Digested Sludge dewatering and disposal approach followed by the City prior to the date hereof shall be maintained as part of the Existing Facilities O&M from the Existing Facilities O&M Effective Date until Substantial Completion. Project Co shall be responsible for the full management of all Dewatered Sludge Cake generated by the Existing Facilities, including processing, handling, storage, transport and disposal.

Project Co shall operate and maintain the Dewatered Sludge Cake Storage Area in compliance with all terms and conditions of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals, including the performance, measurement, sampling, testing and analysis requirements applicable and as may be set out in the Existing Facility Licenses.

Project Co shall only dispose Dewatered Sludge Cake within the Dewatered Sludge Cake Storage Area. Inorganic Sludge shall be disposed in the existing sludge storage lagoons and may only be disposed within the Dewatered Sludge Cake Storage Area with prior written authorization from the City.

4.5.3 Grit Management and Disposal

The grit management approach followed by the City prior to the date hereof shall be maintained as part of the Existing Facilities O&M from the Existing Facilities O&M Effective Date until Substantial Completion. Project Co shall be responsible for the full management of all grit generated by the Existing Facilities, including processing, handling, storage, transport and disposal.

Project Co shall provide all sampling, analysis, record-keeping and reporting for all Residuals management and disposal activities in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. Grit and dewatered Residuals shall be disposed at an accredited landfill. No onsite disposal or storage of grit and dewatered Residuals will be permitted.

The collection, transportation, disposal and/or utilization of all residuals shall be in compliance with Applicable Law, Standards and Guidelines, Permits and Approvals and any applicable Governmental Authority having jurisdiction over these activities.

4.5.4 Flow and Quality Measurement Instruments

Project Co shall maintain the Flow Meters, Pressure Meters, Level Monitors and Quality Monitors that form part of the Existing Facilities from the Existing Facilities O&M Effective Date until Substantial Completion.

Project Co shall inspect, calibrate and test all process, portable and laboratory instrumentation:

- In accordance with the manufacturer's instructions;
- In accordance with the requirements of the Permits and Approvals; and
- As set out in the O&M Plan for Existing Facilities.

The inspection, calibration and testing shall be capable of determining whether each Flow Meter, Level Monitor and Quality Monitor is providing flow, level and quality information within the manufacturers specified accuracy for the instrument.

4.5.5 Noise Control Procedures

Project Co shall manage all noise from the Existing Facilities from the Existing Facilities O&M Effective Date until Substantial Completion. All noise control measures and procedures performed by the City prior to the date hereof shall be maintained to ensure continuance of the level of service. Project Co shall minimize noise impacts and use appropriate noise attenuation, noise barriers and other techniques for reducing noise to meet the permissible sound levels established by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals and in accordance with the environmental and construction requirements of Sections 2.3 and 2.6, respectively.

Project Co shall maintain a full record of all incidents and implemented measures, processes and procedures relating to noise which occur during the Construction Period. Project Co shall make these records available for inspection by the City upon reasonable notice.

4.5.6 Odour Management

Project Co shall be responsible for managing odour from the Existing Facilities from the Existing Facilities O&M Effective Date until Substantial Completion. Project Co shall minimize the emission of odorous compounds generated from the Existing Facilities and shall minimize nuisance odour and odour impacts to the extent practicable and within the capacity of the Existing Facilities.

The application of calcium nitrate shall be conducted by Project Co at the discretion of the City and, unless such application of calcium nitrate is required as a result of the Works associated with Lagoons 1S, 2A, 2, 3 and 4 or a failure by Project Co to comply with its obligation to manage odour in accordance with this Section 4.5.6, at the City's cost.

Project Co shall maintain a full record of all incidents and implemented measures, processes and procedures relating to odour which occur during the Construction Period. Project Co shall make these records available for inspection by the City upon reasonable notice.

4.5.7 Existing Hauled Waste Receiving Station

Project Co shall be responsible for receiving Hauled Waste at the Existing Hauled Waste Receiving Station from the Existing Facilities O&M Effective Date until Substantial Completion.

Project Co shall be responsible for maintaining the Existing Hauled Waste Receiving Station in a clean and orderly state and in a manner that provides access to Registered Haulers. Maintenance activities include site security, snow clearing, odour control, supplemental lagoon aeration and dredging, as required.

The City shall be responsible for registration and administration of Hauled Waste haulers from the Existing Facilities O&M Effective Date to Substantial Completion. Project Co acknowledges that the City may install a card lock system at the Existing Hauled Waste Receiving Station at some point during the Construction Period.

4.5.8 Hydrovac Waste

Project Co shall be responsible for receiving Hydrovac Waste at the receiving station located at the Existing Facilities from the Existing Facilities O&M Effective Date until Substantial Completion.

The existing Hydrovac Waste receiving station is located on the north berm of Lagoon 4D.

Project Co shall be responsible for maintaining Hydrovac Waste receiving facilities in a clean and orderly state and in a manner that provides access to the City from 07:30 to 16:30. Maintenance activities include site security, snow clearing, odour control and dredging, as required.

4.5.9 Security

Project Co shall be responsible for the security of the Existing Facilities from the Existing Facilities O&M Effective Date until Substantial Completion.

Project Co shall be responsible for ensuring that security is in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals with respect to guarding against terrorist and security threats. Project Co shall ensure that all perimeter fencing, gates and gate actuators around the Lands are maintained in an intact and secure manner at all times. Project Co shall give particular consideration to preventing access by snowmobiles to the Existing Lagoons.

Project Co shall maintain a full record of all incidents and implemented measures, processes and procedures relating to security which occur during the Construction Period. Project Co shall make these records available for inspection by the City upon reasonable notice.

4.5.10 Monthly Operation and Maintenance Reporting

Project Co shall be responsible for preparing monthly operations and maintenance reports for the Existing Facilities O&M in accordance with the procedure set out in the O&M Plan for Existing Facilities.

Project Co shall prepare the reports in compliance with the reporting requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. Each monthly operation and maintenance report, shall at a minimum, include the following:

- Provide the City and any applicable Governmental Authority with information reasonably required to assess the adequacy of the delivery of the services;
- Be structured to cover the Existing Facilities O&M as a whole and the work at each facility;
- Description of any periods of reduced service capacity of the Existing Facilities, including an explanation of the cause of any reduction in capacity and a description of the events and actions taken to restore capacity;
- Description of any Treated Wastewater quality sample failures, including copies of the contemporary water quality records from the plant PCS and operating records, an explanation of the cause, details of the date, time, and duration and an explanation, if applicable, of how the quality failure was rectified;
- Significant maintenance and renewal activities in the period, including details of both scheduled and unscheduled maintenance outages;
- Description of any material changes to any of the O&M Plan for Existing Facilities or the Existing Facilities Occupational Health and Safety Plan;
- Staffing and resources, including any changes in personnel;
- Health and safety (including accident records);
- Environmental or public relations issues;
- Set out the monthly energy consumption and the cumulative total energy consumption for the Existing Facilities;
- Set out the submetered amounts in respect of Commodities used for purposes of the Works; and
- Any other relevant issues that may be requested by the City or Governmental Authority from time to time.

Project Co shall prepare and submit to the City the proposed format and contents for the monthly operation and maintenance reports and secure the City's written acceptance prior to the submission of the first month operation and maintenance report.

4.5.11 Annual Operation and Maintenance Reporting

Project Co shall be responsible for preparing for all reports related to chemical use, operations and maintenance of the Existing Facilities or emissions from the Existing Facilities, including, but not limited to annual operation and maintenance reports for the Existing Facilities O&M in accordance with the procedure set out in the O&M Plan for Existing Facilities.

Project Co shall prepare all annual reports in compliance with the annual reporting requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Effluent Standards and Permits and Approvals. Annual reporting requirements shall include, but are not limited to:

- National Pollution Release Inventory;
- Effluent Regulatory Reporting Information System;
- As listed in the Effluent Standards;
- As listed in the Permits and Approvals; and
- Any other annual reports that may be requested by the City or any applicable Governmental Authority from time to time.

Project Co shall prepare and submit to the City the proposed format and contents for the reports and obtain the City's written acceptance prior to the submission of the reports.

4.5.12 Operation and Maintenance Inspections and Meetings

Project Co shall maintain all records of operating data and information relevant to the Existing Facilities O&M, including operating and maintenance cost data for the Asset Management Plan. Project Co shall provide the City access to all such records upon request.

Project Co shall hold a monthly meeting with the City to discuss the Existing Facilities O&M reports and other issues related to the Existing Facilities O&M.

4.5.13 Existing Facilities Performance Failure Payment Adjustment

Project Co shall be assessed (a) a Payment Adjustment of $50,000 upon occurrence, (b) a Payment Adjustment of $50,000 every 24 hours thereafter and (c) a Payment Adjustment of $2,500 for every hour that the Existing Facilities fail to receive flows up to an instantaneous peak flow of 265 ML/d from the City or End-User sewer pipe connections until the uninhibited receipt of Raw Wastewater is restored, unless authorized by the City in accordance with Section 3.8.7.

Project Co shall ensure that the Permits and Approvals remain valid and in good standing, and that all of the requirements of the Permits and Approvals are adhered to throughout the Construction Period.

If Project Co violates or contravenes any of the requirements of the Permits and Approvals, Project Co shall be subject to a Payment Adjustment in the amount set forth in Table 4.5.13 below.

Table 4.5.13 Existing Facilities Performance Failure Payment Adjustments

Non-compliance Event	Monitoring Period	Payment Adjustments for Non-compliance
Any violation of any term or condition of any Permits and Approvals other than the Effluent Standards	Per non-compliance event	$500
Up to and including June 30, 2015, any violation of any term or condition of the Effluent Standards or bypasses to the receiving environment	Per non-compliance parameter per month	$5,000
From and including July 1, 2015, any violation of any term or condition of the Effluent Standards or bypasses to the receiving environment	Per non-compliance parameter per month	$10,000

- Except where otherwise noted, all Payment Adjustments for non-compliance are per occurrence parameter and are additive;
- Up to and including June 30, 2015, a violation of the Total Phosphorus parameter in the Effluent Standards will incur one Payment Adjustment of $5,000 per six-month period;
- From and including July 1, 2015, a violation of the Total Phosphorus parameter in the Effluent Standards will incur one Payment Adjustment of $10,000 per six-month period;
- Multiple violations in a month for a parameter in the Effluent Standards that is not a monthly arithmetic mean, a monthly geometric mean or a six-monthly mean will incur a maximum of one Payment Adjustment per parameter per month; and

- The Payment Adjustments stated above do not include any fines or penalties that may be assessed by any applicable Governmental Authority.

4.5.14 Incident Logging Centre Requirements

The provisions of Section 5.6.16 shall apply, *mutatis mutandis*, from and after the Existing Facilities O&M Effective Date with respect to the Existing Facilities O&M.

4.5.15 Temporary Sludge Storage Area

Project Co shall maintain and monitor the stockpiles until disposal.

4.6 ASSET MANAGEMENT

4.6.1 Asset Records

Project Co shall maintain asset management records for the Existing Facilities, including:

- Records of all routine and reactive maintenance activity; and
- Any asset condition or performance data recorded by Project Co.

4.6.2 Asset Maintenance

Project Co shall develop and perform routine, preventive and predictive maintenance procedures for the Existing Facilities based on Good Industry Practice and manufacturers' recommendations, including mechanical equipment, electrical, instrumentation/control equipment, wastewater process units, buildings and housekeeping activities, yard piping and conveyance equipment and landscaping activities.

Project Co shall maintain computerized and manual records related to all service and repair work performed.

Project Co shall ensure that all preventative maintenance activities, frequencies and requirements for the Existing Facilities are adhered to from the Existing Facilities O&M Effective Date until Substantial Completion.

4.6.3 Materials and Workmanship

Project Co shall ensure that all materials, repairs, replacements and renewals carried out by Project Co as part of its Existing Facilities O&M obligations under this Section 4 shall, unless otherwise specified herein, be of the same quality as the those incorporated into the Existing Facilities, taking into account advancements in materials development and Good Industry Practice at the time of replacement or renewal.

Where parts, systems or components need to be replaced, they shall be replaced with new parts, systems or components. No used or reconditioned parts, systems or components shall be used without the prior written consent of the City.

5 O&M REQUIREMENTS

5.1 GENERAL

Notwithstanding the specific requirements of this Section 5, Project Co shall ensure that the Infrastructure is operated and maintained in a manner that ensures the continuous and uninterrupted delivery of the service to the City and End-Users, and specifically that:

- Infrastructure is operated at all times in full compliance with the Permits and Approvals;
- Available Capacity of the Infrastructure is at all times equal to or greater than the Design Capacity, unless otherwise expressly permitted in the Technical Requirements; and
- Infrastructure meets at all times the quality standards and criteria set forth in Section 3.4.

5.2 DESCRIPTION OF O&M REQUIREMENTS SCOPE LIMITS

The scope of the O&M Requirements for Infrastructure is set forth in this Section 5.

5.3 O&M REPRESENTATIVES

Project Co shall appoint a representative (the "**Project Co O&M Representative**") and shall notify the City of such appointment not less than 40 Business Days before Substantial Completion. The Project Co O&M Representative shall be the person responsible for all communications with the City regarding the O&M.

The City shall appoint a representative (the "**City O&M Representative**") for the Operating Period and shall notify Project Co of such appointments within 10 Business Days of receipt of Project Co's notice of appointment of Project Co O&M Representative. The City O&M Representative shall be the person responsible for all communications with Project Co regarding the O&M.

Project Co O&M Representative and the City O&M Representative may appoint alternates to serve in addition to, or temporarily in their place, or may delegate some of the functions of their respective representatives.

Project Co shall not rely upon any acts, omissions, requirements or directions of the City O&M Representative or any other person whatsoever as authority for any departure from the terms of the Agreement.

5.4 OPERATIONAL AND MAINTENANCE OBJECTIVES

Project Co shall provide O&M of the Infrastructure in a professional and diligent manner during the Operating Period. The O&M shall be performed in a manner and approach that is consistent with achieving the following O&M objectives:

- Protect the health and welfare of the public and the environment;
- Conform with the OH&S;
- Comply with the Effluent Standards;
- Comply with Biosolids and odour requirements;
- Ensure at all times that there is a continuous and reliable service;
- Maintain the availability and readiness of the Infrastructure to meet the Design Capacity;
- Maximize the asset operational efficiency, including utility usage efficiency;
- Protect and preserve the Infrastructure; and
- Perform all related functions with due regard to the intended use of the facilities and in keeping with Good Industry Practice.

Project Co shall conduct predictive, preventive and routine equipment maintenance of the Infrastructure in order to achieve the following overall objectives:

- Preserve the warranty on all equipment while ensuring that the as-installed configuration is within the specification and consistent with the expected operating conditions;
- Perform predictive and preventive maintenance on all equipment in accordance with recommendations of the manufacturer(s) and designer(s) or modifications requested by Project Co and approved by the City, acting reasonably, based on Project Co's operating experience or Good Industry Practice;
- Perform preventative maintenance in such a manner that preserves the condition and functionality of the Infrastructure and the expected useful life; and
- Ensure that fully trained, qualified and appropriately licensed operator, maintenance, laboratory and support staff are assigned to the O&M at all times.

5.5 OPERATION AND MAINTENANCE PLANS

The Operating Period Plans requirements are set out in Section 2.7.

Project Co shall review the Operating Period Plans regularly and, at a minimum, complete formal annual reviews throughout the Operating Period and shall submit any amendments and updates as required in accordance with Schedule 5 (Design and Plan Certification Process and Review).

The maximum time period allowed for completing and submitting any Operating Period Plan amendments shall be two months after the event, activity, modification or change in circumstances that has triggered the amendment.

5.5.1 Payment Adjustment

If the Operating Period Plans are not updated by Project Co and kept in good standing, and any required amendments and updates are not submitted to the City within the time periods stipulated in Section 5.5 above, a Payment Adjustment of $1,000 per month or any partial month for each revised Operating Period Plan, including As-Built Drawings, will be assessed until the revised documents are submitted to the City.

5.5.2 O&M Manuals

Project Co shall, during the Operating Period, monitor, review and update as required the O&M Manuals.

5.5.2.1 Payment Adjustment

The O&M Manuals, including As-Built Drawings, shall be updated, as required, to reflect any modifications that change the physical dimensions or characteristics of the Infrastructure, the replacement of any equipment with a different make or model or any other material changes to the way in which the Infrastructure is operated.

The maximum time for completing such updated As-Built Drawings and updated O&M Manuals shall be two months after completion of the triggering repair, O&M activity or modification. An update summary shall be submitted to the City on an annual basis with the Annual Asset Management Report.

If the updated summary of the O&M Manuals including As-Built Drawings are not submitted with the Annual Asset Management Report, a Payment Adjustment of $2,500 will be assessed per week or any partial week for each outstanding O&M Manual revision, including As-Built Drawings requiring revision, until the revised documents are submitted to the City.

5.6 O&M REQUIREMENTS

This Section 5.6 summarizes the O&M Requirements for the Infrastructure.

Project Co shall implement a system of operation consistent with Project Co’s Designs and Detailed Designs to ensure the reliable and effective function of the Infrastructure.

Project Co's operating regime shall be designed to ensure the delivery of the following operational objectives:

- Operate the Infrastructure to receive and treat wastewater from the City and End-Users to the specified standards at all times;
- Operate the Residuals and Biosolids treatment and odour control system(s) included in Project Co's Designs and Detailed Designs in full compliance with the specified standards set forth in Section 3.4 and the applicable licenses and the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;
- Operate all equipment and treatment processes in the manner for which they were designed, as specified in Project Co's Designs and Detailed Designs;
- Ensure the Infrastructure provides Full Treatment of wastewater prior to discharge to Wascana Creek;
- Meet the Effluent Standards up to a water elevation in Wascana Creek of 563.7 metres; and
- Meet the Effluent Standards, with the exception of the *E. coli* limit, up to a 1/500 Year Flood Elevation.

Project Co shall develop and perform routine, preventive and predictive maintenance procedures for the Infrastructure, including mechanical, electrical and instrumentation/control equipment. Preventive maintenance procedures shall also be developed for all wastewater process units, buildings, structures, piping and housekeeping activities and landscaping activities.

Preventive maintenance procedures shall be developed for each material piece of equipment that identifies frequency, preventative maintenance activities to be performed, warranty period and required materials and tools. The frequency and methods of preventative maintenance activities shall also adhere to vendor warranty requirements during the applicable warranty period and Good Industry Practice. All required maintenance, frequencies of activities, materials, parts and tools shall be included in the preventive maintenance procedures.

5.6.1 Performance Failure Payment Adjustment

Project Co shall be assessed (a) a Payment Adjustment of $50,000 upon occurrence, (b) a Payment Adjustment of $50,000 every 24 hours thereafter and (c) a Payment Adjustment of $5,000 for every hour that the Infrastructure fails to receive the influent quantity and quality as set forth in Section 3.4.2 from the City or End-User sewer pipe connections and within the maximum pressure(s) set forth in Section 3.7.3.14 until the uninhibited receipt of Raw Wastewater is restored, unless authorized by the City in accordance with Section 5.7.9.

If Project Co fails to meet any of the requirements identified in Section 3.4 or contravenes any of the requirements of the Permits and Approvals, Project Co shall be subject to a Payment Adjustment in the amount set forth in Table 5.6.1 below.

Table 5.6.1 Performance and Regulatory Requirements Payment Adjustments

Non-compliance Event	Monitoring Period	Payment Adjustments for Non-compliance
Any violation of any term or condition of any Permits and Approvals other than the Effluent Standards	Per non-compliance event	$500
Any violation of any term or condition of the Effluent Standards (except total ammonia nitrogen, total nitrogen or un-ionized ammonia nitrogen), or any event of Bypass	Per non-compliance parameter per month	$50,000
	Per non-compliance parameter in the second consecutive month for the same non-compliance parameter	$75,000
	Per non-compliance parameter in the third and consecutive months for the same non-compliance parameter	$100,000
Up to and including June 30, 2017, any violation of any term or condition of the Effluent Standards for total ammonia nitrogen, total nitrogen or un-ionized ammonia nitrogen	Per non-compliance parameter per month	$5,000
	Per non-compliance parameter in the second consecutive month for the same non-compliance parameter	$5,000
	Per non-compliance parameter in the third and consecutive months for the same non-compliance parameter	$5,000
From and including July 1, 2017, any violation of any term or condition of the Effluent Standards for total ammonia nitrogen, total nitrogen or un-ionized	Per non-compliance parameter per month	$50,000
	Per non-compliance parameter in the second consecutive month for the same non-	$75,000

Table 5.6.1 Performance and Regulatory Requirements Payment Adjustments		
Non-compliance Event	**Monitoring Period**	**Payment Adjustments for Non-compliance**
ammonia nitrogen	compliance parameter	
	Per non-compliance parameter in the third and consecutive months for the same non-compliance parameter	$100,000
Up to and including June 30, 2017, any violation of Biosolids Criteria set forth in Table 3.4.4	Per monthly fail in the geometric mean of samples for Biosolids fecal coliform density	$5,000
	Per monthly fail in the mean of volatile solids reduction parameter	$5,000
	Per monthly fail in the mean of percent solids of Biosolids	$5,000
From and including July 1, 2017, any violation of Biosolids Criteria set forth in Table 3.4.4	Per monthly fail in the geometric mean of samples for Biosolids fecal coliform density	$50,000
	Per monthly fail in the mean of volatile solids reduction parameter	$50,000
	Per monthly fail in the mean of percent solids of Biosolids	$15,000
Violation of Permissible Sounds Levels set forth in Table 3.7.3.20	Per day	$500
Odour Incident	Per day	$2,500

- Except where otherwise noted, all Payment Adjustments are per occurrence per parameter and are additive.

- Multiple violations in a month for a parameter in the Effluent Standards that is not a monthly arithmetic mean or a monthly geometric mean will incur a maximum of one Payment Adjustment per parameter per month.

- The Payment Adjustments stated above do not include any fines or penalties that may be assessed by any applicable Governmental Authority.

5.6.2 Odour Incident

In the event the City receives three or more independent Odour Complaints within a 24 hour period, the City may undertake an initial investigation to understand the nature of each compliant and whether it may be attributable to an odorous emission from the Lands. To assist in this initial investigation, the City may request any information reasonably required from Project Co, including meteorological conditions, operating conditions and monitoring and trending data and status of odour control equipment and containment systems.

If, after the investigation, it is determined that the Odour Complaints are due to an odorous emission from the Lands and such odorous emission occurred as a result of Project Co's failure to comply with the Odour Management Plan, then Project Co shall be deemed to have received an odour incident (an "**Odour Incident**").

5.6.3 Wastewater Measurement and Testing Minimum Requirements

5.6.3.1 Introduction

This Section 5.6.3 sets out the minimum requirements for measurement, sampling, testing and analysis during the Operating Period. Project Co shall carry out, at its own expense, all measurement and testing required under the Agreement and comply with the requirements of the Permits and Approvals.

It is Project Co's responsibility to demonstrate to the City and to the Governmental Authority having jurisdiction over the Permits and Approvals, that they are meeting the requirements, respectively, of the Agreement and the Permits and Approvals.

5.6.3.2 Measurement of Influent Wastewater Quantity and Treated Wastewater Quantity

5.6.3.2.1 Flow Meters

Project Co shall provide and maintain the Flow Meters as set forth in Section 3.5.3.1 at the locations identified in Project Co's Designs and the Detailed Designs.

Project Co shall inspect, calibrate and test each Flow Meter:

- When it is installed;
- Perform an electronic verification of calibration every six months after Substantial Completion;
- Perform a draw down test, dye calibration test, or equivalent procedure consistent with Good Industry Practice, at least once every 12 months after Substantial Completion; and
- In accordance with the requirements of the permit to operate and any Governmental Authority.

The inspection, calibration and testing shall be capable of determining whether each Flow Meter is providing flow information within the specified accuracy identified in Section 3.5.3.1.

Project Co shall include details of the proposed inspection, calibration and testing equipment and methodology to be followed for the Flow Meter calibration within the Wastewater Sampling and Analysis Plan.

Either the City or Project Co may at any time, by written notice to the other party, request further inspection, calibration or test of a Flow Meter.

The party making the request shall pay the cost and expense of that inspection, calibration or test, unless the outcome of the inspection, calibration or test shows that the relevant Flow Meter is operating outside of the specified accuracy limit identified in Section 3.5.3.1, in which case Project Co shall pay the cost and expense of the inspection, calibration or test.

Project Co shall:

- Record the results of each scheduled and unscheduled inspection, calibration or test of the Flow Meter;
- Provide a copy of the results to the City; and
- Immediately repair or replace any Flow Meter which is shown to be malfunctioning or operating outside the specified accuracy limits as set forth in Section 3.5.3.1 in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan.

5.6.3.2.2 Payment Adjustment

For the following Flow Meter failure events the Payment Adjustments set out below will apply:

- For failure of any of the Flow Meter(s), a Payment Adjustment of $200 per day or part thereof, per Flow Meter, shall be assessed from the day that is 3 days following such failure, until such Flow Meter has been repaired and calibrated in

accordance with the procedures set out in the Wastewater Sampling and Analysis Plan;

- For failure to successfully calibrate the Flow Meter(s) at the frequency set out in Section 5.6.3.2, in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan, a Payment Adjustment of $200 per day or part thereof, per Flow Meter, shall be assessed until Project Co provides evidence that the calibration has been successfully completed and that the Flow Meter is providing information within the accuracy parameters as set out in Section 3.5.3.1; and

- For failure of any of the Flow Meter(s) used to calculate payments, the flow of Raw Wastewater will be deemed to be zero for purpose of payment.

5.6.3.3 Pressure Meters

Project Co shall provide and maintain the Pressure Meters as set forth in Section 3.5.3.2 at the locations identified in Project Co's Designs and the Detailed Designs.

Project Co shall inspect, calibrate and test each Pressure Meter when it is installed and at least once every six months after Substantial Completion.

The inspection, calibration and testing shall be capable of determining whether each Pressure Meter is providing information within the specified accuracy identified in Section 3.5.3.2.

Project Co shall include details of the proposed inspection, calibration and testing equipment and methodology to be followed for the Pressure Meter calibration within the Wastewater Sampling and Analysis Plan.

Either the City or Project Co may at any time, by written notice to the other party, request further inspection, calibration or test of a Pressure Meter. The party making the request shall pay the cost and expense of that inspection, calibration or test, unless the outcome of the inspection, calibration or test shows that the relevant Pressure Meter is operating outside the specified accuracy limit identified in Section 3.5.3.2, in which case Project Co shall pay the cost and expense of the inspection, calibration or test.

Project Co shall:

- Record the results of each scheduled and unscheduled inspection, calibration or test of the Pressure Meter;

- Provide a copy of the results to the City; and

- Immediately repair or replace any Pressure Meter which is shown to be malfunctioning or operating outside the specified accuracy limits as set forth in Section 3.5.3.2, in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan.

5.6.3.3.1 Payment Adjustment

For the following Pressure Meter failure events the Payment Adjustments set out below will apply:

- For failure of any of the Pressure Meter(s), a Payment Adjustment of $200 per day or part thereof, per Pressure Meter, shall be assessed from the day that is 3 days following such failure, until such Pressure Meter has been repaired and calibrated in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan;

- For failure to successfully calibrate the Pressure Meter(s) at the frequency set out in Section 5.6.3.2, in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan, a Payment Adjustment of $200 per day or part thereof, per Pressure Meter, shall be assessed until Project Co provides evidence that the calibration has that been successfully completed to demonstrate the Pressure Meter is providing information within the specified accuracy parameters as set forth in Section 3.5.3.2.

5.6.4 Testing And Wastewater Quality

5.6.4.1 General

Project Co shall procure the necessary laboratory services to carry out the water quality analysis required under the Agreement and the Permits and Approvals. The taking, handling, transporting, storing and analysis of samples shall be performed in accordance with the Technical Requirements and the applicable requirements of any Governmental Authority, Applicable Law, Standards and Guidelines, Effluent Standards and Permits and Approvals.

5.6.4.2 Laboratory Tests

Project Co shall identify and include fixed sampling locations.

Project Co shall perform laboratory tests on:

- Raw Wastewater samples collected at a point collected downstream of the Influent Diversion Chamber but prior to any wastewater treatment process;

- Treated Wastewater samples collected from a point downstream of any disinfection process but prior to the Treated Wastewater outfall to Wascana Creek; and

- Samples collected as required by the Effluent Standards.

Project Co shall perform laboratory tests in accordance with the requirements of the following:

- the Effluent Standards;

- any payment calculation conduct in accordance with Schedule 14 (Payment Schedule);

- the quality standards and criteria set forth in Section 3.4 and elsewhere in the Agreement; and

- Good Industry Practice.

Wherever the Effluent Sta0ndards require sampling and performance of laboratory tests five days per week for certain treated effluent parameters, Project Co shall sample and perform such laboratory tests seven days per week.

5.6.5 Monthly Wastewater Quality Report

Project Co shall prepare and deliver monthly wastewater quality reports (the "**Wastewater Quality Reports**") to the City on the 15th day of each month. The Wastewater Quality Reports shall include a summary of all the quality testing performed during the previous calendar month and, in accordance with the Wastewater Sampling and Analysis Plan, a summary of the results of Project Co's quality assurance and quality control program ("**QA/QC**").

If required by the City, Project Co shall direct the laboratory undertaking the analysis of the samples to send the results of the analysis to the City and Project Co at the same time.

5.6.5.1 Payment Adjustment

If Project Co fails to submit the Wastewater Quality Report or submits incomplete Wastewater Quality Reports to the City as per Section 5.6.5 on or before the 15th day of each month, a Payment Adjustment of $1,000 will be assessed for each day or part thereof until the complete Wastewater Quality Report is submitted.

5.6.6 Noise Control Procedures

Project Co shall minimize noise impacts and use appropriate noise attenuation, noise barriers and other techniques for reducing noise to meet the permissible sound levels set forth in Table 3.7.3.20 and by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals.

5.6.6.1 Payment Adjustment

If Project Co does not perform necessary permanent repairs, adjustments or remedies within 7 calendar days of failing to comply with the permissible sounds levels, a Payment Adjustment of $500 per day or part thereof will be assessed until the permanent repairs are completed.

5.6.7 Odour Management Plan And Procedures

Project Co shall minimize the emission of odorous compounds generated from the Lands as well as meet the Odour Criteria and the applicable requirements of Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals.

5.6.7.1 Odour Verification Program

Project Co shall complete an odour verification program during the worst odour emission conditions and the later of: i) July/August following Substantial Completion; or ii) when the Infrastructure is in service and the emission sources are representative of typical worst case operating conditions (the "**Odour Verification Program**"). The timing for carrying out the Odour Verification Program shall be agreed to between Project Co and the City, and once agreed to, the Odour Verification Report shall be complete and submitted to the City no later than 80 business days after the agreed upon date of commencing the program. Once the timing of the program is confirmed, no later than 30 days before the commencement of the Odour Verification Program, Project Co shall update the Odour Management Plan to include the protocol for the Odour Verification Program as described in this section and submit to the City for review.

The Odour Verification Program shall demonstrate that Odour Criteria specified in Section 3.4.5 are met using the odour dispersion methodology described in Section 3.7.3.19. The input odour emission rates shall be based on direct measurement of all odour emission sources on the Lands, including Beneficially Reused Biosolids and wet weather storage lagoons during worst case conditions in the summer. The method of direct measurement shall employ the odour panel testing methodology specified in ASTM E-679.

Odour samples shall be collected over five consecutive days by an independent company specializing in such work at a time of day that is determined to be characteristic of the highest odour emissions. The samples shall be collected and stored so as to ensure that contamination, dilution, absorption effects and sample deterioration are minimized. Samples shall be subjected to odour panel evaluation by an independent company retained by Project Co specializing in such work within 24 hours from time of collection. Samples shall be pre-diluted to minimize adsorption of organics on sample collection vessels.

No later than 30 days before the Odour Verification Program is to commence, Project Co shall submit the name of the independent company that will collect the odour samples and perform odour panel testing for the City's review. The company shall have a proven track record of such specialized work and provide at least 5 references for similar work in the last 5 years. Submit proposed sampling and odour panel testing methodologies and associated Project Co QA/QC plans for review by the City prior to performing the work.

Project Co shall submit the results of the odour panel testing and calculated emission rates to the City and compare them to odour emission rates and treatment efficiencies used in the design development report submitted with the 30% design submittal. Project Co shall demonstrate that Infrastructure meets Odour Criteria specified in Section 3.4.5 using the highest odour emission rates reported by the independent odour panel testing company.

If dispersion modelling demonstrates odour concentrations above the Odour Criteria, Project Co shall undertake all necessary measures, at its own effort and cost, to meet the Odour Criteria. After optimizing the performance of the Infrastructure and/or installation of new equipment as required, Project Co shall collect samples from emission sources as required by this Section 5.6.7 and re-run odour dispersion modelling to demonstrate compliance with Odour Criteria in accordance with protocol described in this section.

5.6.7.2 Odour Verification Report

Project Co shall prepare and deliver the odour verification report (the "**Odour Verification Report**") to the City 8 weeks after completion of the applicable Odour Verification Program.

5.6.7.3 Payment Adjustment

If Project Co fails to implement all of the odour control measures and procedures set out in the Odour Management Plan, a Payment Adjustment of $1,000 will be assessed for each day or part thereof until Project Co is in full compliance with the Odour Management Plan.

If Project Co fails to carry out the Odour Verification Program, a Payment Adjustment of $1,000 will be assessed for each day or part thereof until the Odour Verification Program is completed.

5.6.8 Laboratory Protocols And Testing Procedures

With respect to any monitoring required pursuant to the Agreement, Project Co shall collect, preserve, store, handle and analyze all sampling in accordance with Standard Methods.

Project Co shall use an Accredited Laboratory where required by any applicable Governmental Authority, Applicable Law, Standards and Guidelines or Permits and Approvals. Where not required to do so, Project Co may perform laboratory testing itself or elect to utilize an outside Accredited Laboratory to perform any or all of the analytical testing.

If Project Co performs laboratory testing itself, it shall:

- Conduct a quality assurance and quality control program consistent with the requirements of the Canadian Association for Laboratory Accreditation (e.g. Section A of the *British Columbia Environmental Laboratory Manual*) and in accordance with Good Industry Practice; and

- Provide independent, certified technicians to perform calibration of the analytical instruments according to the manufacturer's instructions and annually thereafter.

Project Co shall ensure that laboratory operations are set up, audited and monitored to ensure compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Permits and Approvals and the Wastewater Sampling and Analysis Plan.

Project Co shall also provide for all sampling, testing and analytical procedures to demonstrate compliance with the Agreement. In addition, Project Co shall perform all sampling and testing related to operational process control. Such process control testing shall be described in the Wastewater Sampling and Analysis Plan.

5.6.9 Residuals Management

Project Co shall be responsible for all aspects of Residuals management including processing, handling, storage, transport and the ultimate disposal of all Residuals generated on the Lands. The collection, transportation and disposal and/or utilization of all Residuals shall be in compliance with Applicable Law. Project Co shall provide all sampling, analysis, record-keeping and reporting for all Residuals in accordance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. At the request of City, Project Co shall provide documentation related to disposal of Residuals. Residuals shall not be stored or disposed of on the Lands.

5.6.9.1 Payment Adjustment

If Project Co fails to:

- Dispose of the Residuals to the designated facility named in the Residuals Management Plan, a Payment Adjustment of $2,000 will be assessed for each failure, for which purpose each separate load or vehicle movement will be classed as a discrete failure; or

- Maintain proper records of Residuals disposal in accordance with Section 5.6.9 or the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals, then a Payment Adjustment of $200 per incident will be applied, for which purpose each missing or erroneous document, including bills of lading, movement licenses and other documents relating to residual disposals will be assessed as a discrete failure.

5.6.10 Biosolids And Existing Lagoons Management

Project Co shall be responsible for all aspects of Biosolids and Existing Lagoons management including:

- Processing, handling, storage, transport and beneficial reuse of Biosolids on the Lands;

- Developing cell(s) within the Existing Lagoons to accept Biosolids in accordance with Section 3.4.6;

- Implementing practices to minimize the generation of stormwater runoff and leachate within a Working Cell and directing it to the Infrastructure for full treatment and implement other practices as required and consistent with Good Industry Practice;

- Operation and maintenance of existing sludge inventory in Existing Lagoons;
- Operation and maintenance of existing sludge inventory at Dewatered Sludge Cake Storage Area;
- Maintaining existing access roads for transport of Biosolids on the Lands;
- Minimizing odour emissions;
- Capping, grading and landscaping of finished Working Cell;
- Collecting runoff from finished Working Cells and managing in accordance with Project Co's stormwater management plan for the Lands described in the Operations and Maintenance Plan;
- Taking reasonable measures to protect existing berms and underlying clay formation in accordance with Good Industry Practice; and
- Practice landscape maintenance of the Existing Lagoons berms and covers to minimize vegetation growth which could damage permeability and/or structural integrity.

Subject to prior written consent of the City and the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals, Project Co may dispose of Biosolids off the Lands.

5.6.10.1 Existing Sludge Storage Lagoons

Project Co shall be responsible for taking all reasonable measures to prevent the generation of odours, mosquitoes, dust and other nuisances from the Existing Lagoons 1N-A, 1N, 4D, 4E and 4F in accordance with the Biosolids and Existing Lagoons Management Plan. If Project Co elects not to maintain a minimum average open water cover depth of 300 mm, Project Co shall demonstrate to the City how it will prevent the generation of odours, mosquitoes, dust and other nuisances. Project Co shall prevent wind-generated waves from over-topping the berms.

5.6.10.2 Existing Lagoons Used for Beneficially Reused Biosolids

Project Co shall be responsible for developing cell(s) within Existing Lagoons for storing Beneficially Reused Biosolids in accordance with Sections 3.4.4 and 3.4.6. Project Co shall, at a minimum, meet the following requirements:

- The volume, configuration, sequencing of development and other features of each individual cell shall be at Project Co's discretion and meet the requirements of the Agreement and the Biosolids and Existing Lagoons Management Plan;
- Each cell shall be segregated from surrounding Existing Lagoons using impermeable interior berms;

- Once a cell is segregated from the surrounding Existing Lagoons, it shall be dewatered;

- Existing inventory shall be handled using Good Industry Practice for minimizing odour generation and in accordance with one of the following:

    - Dewatered using freeze and thaw method;

    - Dewatered using mechanical means;

    - Transferred to an Existing Lagoon designated as having no functional purpose; or

    - A similar method to provide the same functionality;

- The cell shall be sloped to an area within the cell to facilitate collection of run-off and other liquids to minimize generation of leachate and all liquid collected in the cell shall be returned to the Infrastructure for treatment;

- Once a cell is developed and ready to accept Biosolids at Project Co's discretion it may be put into service ("**Working Cell**");

- Beneficially Reused Biosolids shall be placed in the Working Cell in a manner that minimizes odour emissions and in accordance with the following:

    - All Beneficially Reused Biosolids placed in a Working Cell shall, at a minimum, be covered daily when the average atmospheric daily temperature is at or above 0 degree C;

    - The cover material and method of placement of cover material shall be adequate to prevent odour emissions above 5 D/T from the covered Beneficially Reused Biosolids at the boundary of the Lands;

    - Daily cover will not be required when the average daily temperature is below 0 degree C;

    - All Beneficially Reused Biosolids placed in Working Cells without daily cover shall be covered before Beneficially Reused Biosolids thaw in the spring or sooner if the odour generation potential is likely to cause odour emissions above 5 D/T at the boundary of the Lands; and

    - Notwithstanding any of the above, if Beneficially Reused Biosolids, whether covered or not, are likely to cause or do cause odour emissions above 5 D/T at the boundary of the Lands, Project Co shall take measures to reduce odours emissions below 5 D/T;

- Beneficially Reused Biosolids transported on the Lands shall be transported in a manner that minimizes odour emissions;

- Beneficially Reused Biosolids shall be placed in the Working Cells, in accordance with Good Industry Practice, to prevent localized slope failure and localized bearing capacity failure. Underdrains, amendment and intermediate and final cover shall be used as required. Final cover shall have sufficient bearing capacity to allow vehicular traffic (minimum 1 ton pickup truck). Geotechnical aspects of the Biosolids and Existing Lagoons Management Plan shall be certified by a Professional Engineer;

- Beneficially Reused Biosolids shall be graded as required to suit the final grading plan developed by Project Co;

- Beneficially Reused Biosolids shall be capped with impermeable material and a minimum of 200 mm of top soil applied and seeded with dry land mix in accordance with the City of Regina Standard Construction Manual; and

- The final grade of each cell shall be above the elevation of the existing berms and each cell shall be sloped to facilitate the collection of run-off at the toe of the slope and run-off shall be managed in accordance with Project Co's stormwater management plan for the Lands described in the O&M Plan.

Project Co may propose alternate methods to provide the same functionality for review by the City in accordance with Schedule 5 (Design and Plan Certification and Review Procedure).

5.6.10.3 Existing Lagoons with No Functional Purpose

Project Co shall be responsible for taking all reasonable measures to prevent the generation of odours, mosquitoes, dust and other nuisances from the Existing Lagoons with no functional purpose in accordance with the Biosolids and Existing Lagoons Management Plan. If Project Co elects not to maintain a minimum average open water cover depth of 300 mm, Project Co shall demonstrate to the City how it will prevent the generation of odours, mosquitoes, dust and other nuisances. Project Co shall prevent wind-generated waves from over-topping the berms.

5.6.10.4 Odour

The following areas shall not be considered odour emission sources for the purpose of odour dispersion modelling in Section 3.7.3.19:

- Existing Lagoons which have no allowable use or no functional purpose as designated pursuant to Section 3.4.6 if Project Co elects to maintain such Existing Lagoons with a minimum average open water cover depth of 300 mm as set out in Sections 5.6.10.1 and 5.6.10.3;

- Existing Lagoons which have no allowable use or no functional purpose as designated pursuant to Section 3.4.6 if Project Co elects to maintain such Existing

Lagoons with an average open water cover depth of less than 300 mm, provided that Project Co can demonstrate to the satisfaction of the City using the same general methodology set out in Section 5.6.7.1 that odour emissions are no greater than predicted odour impacts from Existing Lagoons operated with at least a minimum average open water cover depth of 300 mm;

- Portions of Existing Lagoons that have not been developed by Project Co and used for Beneficially Reused Biosolids;

- When a Beneficially Reused Biosolids cell is in the process of being developed by Project Co to receive Beneficially Reused Biosolids and before it is put into service;

- Transport of Beneficially Reused Biosolids to the Working Cell and placement of Beneficially Reused Biosolids in the Working Cell provided that such areas are being maintained in accordance with this Section 5.6.10; and

- Dewatered Sludge Cake Storage Area.

With the exception of Beneficially Reused Biosolids transport to the Working Cells and placement of Beneficially Reused Biosolids in the Working Cells, odour emissions from all Working Cells shall be considered an odour emission source and included in the odour dispersion modelling provided that such areas are being maintained in accordance with this Section 5.6.10.

5.6.10.5 Dewatered Sludge Cake Storage Area

Project Co shall maintain existing sludge inventory in the existing Dewatered Sludge Cake Storage Area and manage stormwater runoff in accordance with Project Co's stormwater management plan. All runoff shall be discharged to the Infrastructure for Full Treatment.

5.6.10.6 Access Roads

Project Co shall maintain all existing and new roads to provide access to all areas used to store Beneficially Reused Biosolids.

5.6.10.7 Payment Adjustment

If Project Co fails to:

- Maintain an Existing Lagoon designated pursuant to Section 3.4.6 as no allowable use, no functional purpose, wet weather flow storage or emergency storage in accordance with the Biosolids and Existing Lagoons Management Plan and such failure does not result in an Odour Incident, a Payment Adjustment of $200 will be assessed for each day or part thereof;

- Maintain an Existing Lagoon designated pursuant to Section 3.4.6 as no allowable use, no functional purpose, wet weather flow storage or emergency storage in accordance with the Biosolids and Existing Lagoons Management Plan and such failure does result in an Odour Incident, a Payment Adjustment will be assessed as stipulated in Section 5.6.1;

- Prevent wind-generated waves from over-topping the berms, a Payment Adjustment of $200 will be assessed for each day or part thereof; or

- Manage the Infrastructure in accordance with the Biosolids and Existing Lagoons Management Plan, a Payment Adjustment of $2,000 will be assessed for each day or part thereof.

5.6.11 Security

Project Co shall develop a Security Plan (in accordance with Section 2.7.9) as one of the Operating Period Plans. Project Co shall implement the security measures, processes and procedures set out in the Security Plan and shall ensure security is in compliance with the requirements of any applicable Governmental Authority and all Applicable Law with respect to guarding against terrorist and security threats.

Project Co shall maintain a full record of all incidents and implemented measures, processes and procedures relating to security which occur during the Operating Period. Project Co shall make these records available for inspection by the City upon reasonable notice and shall present a report of them to the City annually.

5.6.11.1 Payment Adjustment

If Project Co fails to provide the security report to the City as per Section 5.6.11 within two weeks of the calendar year end, a Payment Adjustment of $200 will be assessed for each day or part thereof until the complete report is submitted.

If Project Co fails to implement any of the security measures, processes and procedures set out in the Security Plan, a Payment Adjustment of $200 will be assessed for each day or part thereof until the security measures, processes and procedures are brought into full compliance with the Security Plan.

5.6.12 Monthly O&M Reporting

Project Co shall prepare monthly O&M reports in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals. Each monthly O&M report, shall at a minimum, include the following:

- Provide the City with information reasonably required to assess the adequacy of the delivery of the O&M;

- Description of any periods of reduced service capacity of the Infrastructure, including an explanation of the cause of any reduction in capacity and a description of the events and actions taken to restore capacity;
- Description of any Treated Wastewater quality sample failures, including copies of the contemporary wastewater quality records from the plant PCS and operating records, an explanation of the cause, details of the date, time, and duration, and an explanation, if applicable, of how the quality failure was rectified;
- Any material development in relation to the O&M;
- Significant maintenance and renewal activities in the period, including details of any routine or unscheduled maintenance outages;
- Description of any material changes to any of the Operating Period Plans;
- Staffing and resources, including any changes in personnel;
- Health and safety (including accident records);
- Changes in Applicable Law, actual or anticipated;
- Environmental or public relations issues;
- Description of material changes or major maintenance activities planned for the following month, three month and six months ahead; and
- Any other relevant issues.

Project Co shall prepare and submit to the City the proposed format and contents for the monthly O&M reports and secure the City written acceptance prior to the submission of the first month O&M report.

5.6.12.1 Payment Adjustment

If Project Co fails to submit the monthly O&M report(s) to the City, in compliance with the monthly O&M report requirements as per Section 5.6.12 on or before the 15th day of the end of the month, a Payment Adjustment of $200 will be assessed for each day or part thereof until the complete monthly O&M report is submitted. If the monthly O&M report is incomplete or does not fulfil the requirements of the Permits and Approvals and the minimum requirements described in Section 5.6.12, then the Payment Adjustment will be applied until a complete monthly O&M report is submitted.

5.6.13 Annual O&M Reporting

Project Co shall be responsible for preparing for all reports related to chemical use, operations and maintenance of Infrastructure or emissions from Infrastructure, including, but not limited to

annual operation and maintenance reports for the O&M in accordance with the procedure set out in the Operation & Maintenance Plan.

Project Co shall prepare all reports in compliance with the annual reporting requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, Effluent Standards and Permits and Approvals. Annual reporting requirements shall include, but are not limited to:

- National Pollution Release Inventory;
- Effluent Regulatory Reporting Information System;
- As listed in the Effluent Standards;
- As listed in the Permits and Approvals; and
- Any other annual reports that may be requested by the City or any applicable Governmental Authority from time to time.

Project Co shall prepare and submit to the City the proposed format and contents for the reports and obtain the City's written acceptance prior to the submission of the reports.

Project Co shall prepare an annual O&M report in compliance with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals (the "**Annual O&M Report**"). Each Annual O&M Report, shall at a minimum, include the following:

- Provide the City with information reasonably required to assess the adequacy of the delivery of the O&M;
- Be structured to cover the O&M as a whole and the work at the facility;
- Cover remainder of the calendar year following Substantial Completion and each twelve months thereafter;
- Include all of the information required as part of the monthly O&M report summarized appropriately to describe the whole year;
- Explain any discernible annual term trends in the Treated Wastewater quality;
- Describe any planned update or changes to any of the Operating Period Plans in the year ahead;
- Summarize health and safety (including accident records) performance for the year;
- Identify any changes in Applicable Law anticipated for the coming year;

- Describe any material changes to the Infrastructure or major maintenance activities planned for the following year;
- Identify any long term O&M improvement plans, initiatives or other service improvements for the coming year;
- Set out detailed information on the current condition of the Infrastructure;
- Describe the Biosolids and Residuals management and disposal activities completed during the period;
- Set out any information required pertaining to the regulatory approvals; and
- Set out the annual energy consumption for the Infrastructure.

Project Co shall prepare and submit to the City the proposed format and contents for the Annual O&M Report and obtain the City written acceptance prior to the submission of the first Annual O&M Report.

5.6.13.1 Payment Adjustment

If Project Co fails to submit the Annual O&M Report to the City, in compliance with the Annual O&M Report requirements set out in Section 5.6.13 within 60 days of the end of the year, a Payment Adjustment of $500 will be assessed for each day or part thereof until the complete Annual O&M Report is submitted.

If the Annual O&M Report is incomplete or does not fulfil the requirements of the Permits and Approvals, and the minimum requirements described in Section 5.6.13, then the Payment Adjustment will be applied until a complete Annual O&M Report is submitted.

5.6.14 O&M Inspections and Meetings

Project Co shall maintain all records of operating data and information relevant to the Infrastructure and performance of the O&M, including operating and maintenance cost data for the Asset Management Plan. Project Co shall provide the City access to all such records upon request.

Project Co shall hold monthly and annual meetings with the City to discuss the monthly and Annual O&M Reports and other issues related to the O&M.

5.6.15 Infrastructure Tours

Project Co shall host and attend tours of the Infrastructure upon reasonable request by the City. Project Co may host other tours of the Infrastructure with the prior written permission of the City.

5.6.16 Incident Logging Centre

5.6.16.1 Incident Logging Centre Requirements

Project Co shall provide a central repository and database for all information concerning the End-User and Governmental Authority interface with the Infrastructure, and for all Performance Failures and Major Incidents however they may be identified, including self-reporting by Project Co of all Payment Adjustments. This information shall be compiled in the Monthly Incident Logging Centre Report submitted to the City together with Project Co's payment calculation submission in accordance with Schedule 14 (Payment Schedule). Project Co shall develop an Incident Logging Centre Plan (refer to Section 2.4.5) as one of the Operating Period Plans.

The City shall be responsible for receiving complaints from the public, End-Users or notices from any applicable Governmental Authority concerning O&M during the Operating Period. The City shall make an initial determination on whether the complaint or notice relates to O&M and if such a determination is made the City may request the following of Project Co:

- Investigate the complaint or notice and report to the City on the findings of the investigation within a reasonable period of time depending on its severity and in any event not more than 24 hours upon receipt of notification from the City's O&M Representative; and

- If the complaint or notice is caused by O&M then Project Co shall remedy it in accordance with the Agreement.

Performance Failures, Major Incidents, Payment Adjustments and other incidents may be logged by the City if the City becomes aware of such information.

Performance Failures, Major Incidents, Payment Adjustments and other incidents that are identified by Project Co or any Project Co Party through routine O&M activities, monitoring, inspection or testing shall also be logged promptly by Project Co.

Project Co shall ensure the Incident Logging Centre records into the electronic log all relevant details, including, but not limited to, the following information:

- Incident Logging Centre operator's name;

- Requester's name;

- Date and time;

- Repair or correction required;

- Performance Failures categorization, including allocation to the failure categories set out in Section 5.6.1 and the identification of the affected service area(s);

- Full incident description;

- Request response time;

- Unique request reference identifier;
- Subcontractor and contact name to which the request was passed, if applicable;
- Date and time request was passed to the relevant Subcontractor, if applicable;
- Action taken and by whom; and
- Rectification time for any Performance Failure, Major Incident or any other repair or rectification action performed in response to an Incident Logging Centre contact.

Project Co shall not delete or alter any details recorded by the Incident Logging Centre unless approved in writing in advance by City and the following information is recorded:

- The exact nature and impact of the alteration or deletion;
- The reason for the alteration or deletion; and
- The name of the person who authorized the alteration or deletion.

If Project Co receives a complaint directly from End-User or notice from Governmental Authority it shall respond in accordance with the Agreement and shall notify the City O&M Representative within 1 hour. The form of communication of complaint or notice may include, but not limited to, phone call, personal communication, email and hotline. Project Co shall record the pertinent information in accordance with Incident Logging Centre electronic log.

Incident Logging Centre shall have the following features:

- A telephone contact line and a database for recording all contacts, incidents and events relating to the performance of the O&M;
- Operate 24 hours per day each day of the year;
- Daily log of all inquiries from City, and complaints, notices and direct communication with End-Users and Governmental Authority;
- Daily log of any Performance Failures including quantity, capacity or quality failures;
- Daily log of Major Incidents;
- Daily log of security events;
- Daily log of Payment Adjustments; and

- Initiate first response procedures for raising alarms, reporting events to internal and external authorities and logging details of emergencies as described in Project Co's Management System and Plans including, but not limited to, the Emergency Response Plan.

5.6.16.2 Incident Logging Centre Performance Requirements

Project Co shall ensure that the Incident Logging Centre meets the following performance requirements during the Operating Period:

- All contacts, enquiries, complaints, emergencies, Major Incidents and Performance Failures notified to the Incident Logging Centre shall be logged by the Incident Logging Centre;

- All response and rectification actions, including timing of events, must be logged by the Incident Logging Centre;

- Access to Incident Logging Centre records and logs shall be provided to the City as requested by the City;

- Project Co shall report any Major Incidents and other notices and events, that City, acting reasonably, requests notification of, to the City O&M Representative within one hour of occurrence; and

- City shall provide Project Co with a list of additional events requiring notification within one hour of occurrence.

5.6.16.3 Monitoring for Compliance

For each month following the first calendar month of the Operating Period, Project Co shall submit to the City on or before the 7th day after the end of the month a monthly Incident Logging Centre report ("**Monthly Incident Logging Centre Report**") which summarizes all of the Incident Logging Centre database records logged in the previous calendar month in sufficient detail to determine compliance with the requirements of this Section 5.6.16.

5.6.16.4 Payment Adjustment

If Project Co fails to:

- Record, with reference to the Monthly Incident Logging Centre Report, all contacts, enquiries, complaints, emergencies, and infrastructure performance failures notified to the Incident Logging Centre, regardless of time of day such request or report of an Performance Failure occurs, a Payment Adjustment of $200 per failure will be assessed;

- Record, with reference to the Monthly Incident Logging Centre Report, all response and rectification actions on response to the contacts, enquiries,

complaints, emergencies, notices and infrastructure performance failures received by the Incident Logging Centre, including the timing of events, a Payment Adjustment of $200 per failure will be assessed;

- Provide a complete Monthly Incident Logging Centre Report within the time stipulated, a Payment Adjustment of $200 per day or part thereof will be assessed until Project Co submits a complete Monthly Call Centre Report; and

- Notify the City in accordance with this Section 5.6.16, within the time period stipulated therein, a Payment Adjustment of $1,000 will be assessed per day or part thereof until properly reported.

5.7 ASSET MANAGEMENT

5.7.1 Preamble

Project Co is responsible for the asset management of the Infrastructure throughout the Operating Period and shall provide an Asset Management Plan (in accordance with Section 2.7.10), and the requirements of this Section 5.7.

5.7.2 Objectives

The main objectives of Project Co's asset management program shall be as follows:

- Measure and monitor the condition and performance of the assets comprising the Infrastructure;

- Ensure that the assets are managed, operated, maintained, renewed and replaced such that they are fit for their intended purpose and that they are capable of meeting the Technical Requirements and delivering uninterrupted service to the End-Users throughout the Operating Period; and

- Ensure the Infrastructure meets the Handback Requirements.

5.7.3 Asset Records

Project Co is responsible for developing an asset numbering and tagging system for the Infrastructure, assigning individual identification numbers to each asset including all elements of the Existing Facilities that from part of Project Co's Designs and the Detailed Designs.

5.7.4 Annual Dependability Tests

Project Co shall conduct Annual Dependability Tests on the Infrastructure at such time as may be agreed by the parties, acting reasonably. Project Co shall develop an Annual Dependability Test plan that describes the methodology and procedure for the Annual Dependability Tests.

The Annual Dependability Tests shall demonstrate the capability of the Infrastructure to meet the Design Capacity and verify the performance of the Infrastructure in accordance with Project Co's Designs and Detailed Designs. Project Co shall summarize which Infrastructure component is available for operation and at a minimum either manually or remote-manually operate Infrastructure from the PCS to physically operate each piece of equipment at its governing design condition.

Project Co shall give the City a minimum of two weeks' notice of the date of the Annual Dependability Tests to afford the City the opportunity to witness the tests if so desired.

The City may, in its sole discretion, waive in writing the requirement to conduct the Annual Dependability Tests, in which case the Infrastructure shall be deemed to have successfully passed the Annual Dependability Test for the following twelve month period. Any such waiver by City shall not relieve Project Co of its responsibility to conduct Annual Dependability Tests just before each and every subsequent anniversary date of Substantial Completion.

The Annual Dependability Tests shall be documented and reported to the City.

5.7.4.1 Payment Adjustment

If Project Co fails to submit the Annual Dependability Test report(s) to the City in accordance with Section 5.7.4 no later than two weeks after completion of the applicable Annual Dependability Tests(s), a Payment Adjustment of $1,000 will be assessed for each day or part thereof until the complete report is submitted. If the report is incomplete then the Payment Adjustment will be applied until a complete report is submitted.

If the results of the Annual Dependability Test(s) show that the capacity of the Infrastructure is less than the Design Capacity, then the maximum Declared Capacity shall be limited to the capacity recorded by Annual Dependability Test(s), and the Payment Adjustments for capacity deductions set out in Section 5.7.5.1 shall apply until Project Co rectifies the Infrastructure and repeats the Annual Dependability Test(s) to successfully demonstrate that Available Capacity is equal to or greater than the Design Capacity.

If Project Co fails to carry out the Annual Dependability Test on or before the first anniversary of Substantial Completion, and on or before each anniversary date of Substantial Completion thereafter, then a Payment Adjustment of $1,000 will be assessed for each day or part thereof until the Annual Dependability Tests are completed.

5.7.5 Capacity Deductions

Project Co shall monitor and measure the Available Capacity of the Infrastructure at all times. At the end of each Month, Project Co shall summarize on a daily basis which Infrastructure was in service or available to be put into service and use said information to measure and report Available Capacity.

In the event that the Available Capacity of the Infrastructure is reduced below the Design Capacity for the Infrastructure for longer than a continuous period of 72 hours, Project Co shall

declare the reduced capacity as the Declared Capacity in the Operating Period Payment Calculation and the Payment Adjustments set out in Section 5.7.5.1 shall be applied.

5.7.5.1 Payment Adjustment

If the Available Capacity for the Infrastructure is less than the Design Capacity then the following Payment Adjustments shall apply, unless the reduction in the Available Capacity is authorized as part of the Approved Planned Maintenance:

- The Declared Capacity of the Infrastructure is 10 ≤ 25 percent less than the Infrastructure Design Capacity, a Payment Adjustment of $2,500 will be assessed for each day or part; or

- The Declared Capacity of the Infrastructure is > 25 percent less than the Infrastructure Design Capacity, a Payment Adjustment of $5,000 will be assessed for each day or part thereof.

The Payment Adjustments set out above shall apply separately to each and every failure day recorded, including successive failures of the same components of the Infrastructure.

If Project Co fails to self-assess any period of Declared Capacity less than the Design Capacity in the Operating Period Payment Calculation, then a Payment Adjustment of $5,000 will be assessed for each individual reporting failure.

5.7.6 Semi-Annual Asset Management Reports

Project Co shall provide the City with semi-annual asset management reports (the "**Semi-Annual Asset Management Reports**") for the Infrastructure during the Operating Period as part of the asset management program. Thereafter, Project Co shall finalize the first Semi-Annual Asset Management Report on or before the 7th day of the 7th month following Substantial Completion.

The Semi-Annual Asset Management Report shall be updated semi-annually on or before the 7th day of the month ending the relevant semi-annual period.

Each Semi-Annual Asset Management Report shall:

- Provide the City with information reasonably required to monitor the asset condition;

- Be structured to cover the Infrastructure as a whole and each discrete facility;

- Include information on asset condition;

- Summarize the predictive and preventive maintenance undertaken in the period since the last Semi-Annual Asset Management Report or Annual Asset Management Report;

- Set-out the asset management program for upcoming asset repairs and renewal for one month, three month and six months ahead;

- Clearly identify any planned maintenance in the next six month period, including the precise timing, duration and extent of the work that is planned; and

- Highlight any other relevant asset management issues and outstanding issues and activities since previous Semi-Annual Asset Management Report.

Project Co shall include supporting information from the CMMS system in the Semi-Annual Asset Management Reports. The Semi-Annual Asset Management Report format shall be set out in the Asset Management Plan.

5.7.6.1 Payment Adjustment

If Project Co fails to submit the Semi-Annual Asset Management Report(s) to the City as per Section 5.7.6 on or before the 7th day of the month ending the relevant semi-annual period, a Payment Adjustment of $200 will be assessed for each day or part thereof until the complete Semi-Annual Asset Management Report is submitted.

If the Semi-Annual Asset Management Report is incomplete then the Payment Adjustment will be applied until a complete report is submitted.

5.7.7 Annual Asset Management Reports

Project Co shall provide the City with annual asset management report(s) (the "**Annual Asset Management Reports**") of the managed assets during the Operating Period as part of the asset management program. Project Co shall finalize the first Annual Asset Management Report within the first two weeks following the first anniversary of Substantial Completion.

The Annual Asset Management Report shall be updated annually within the first two weeks following every subsequent anniversary date of Substantial Completion.

Each Annual Asset Management Report shall:

- Provide the City with information reasonably required to monitor the asset condition;

- Be structured to cover the O&M as a whole and the work at each facility;

- Cover the twelve month period from the Substantial Completion date and each twelve months thereafter;

- Include the same information required as part of the Semi-Annual Asset Management Report, summarized as appropriate to cover the whole year;

- Set out the asset management program for upcoming asset repairs and renewal the following year;

- Clearly identify any planned maintenance in the next six month and twelve periods, including the precise timing, duration and extent of the work that is planned;

- Identify any changes in Applicable Law anticipated for the coming year that will require modification or investment in the assets to maintain legislative compliance;

- Identify any long term asset improvement plans, asset management initiatives or other improvements for the coming year; and

- Highlight any other relevant asset management issues.

Project Co shall include information obtained and managed through the CMMS in the Annual Asset Management Report. The Annual Asset Management Report format shall be set out in the Asset Management Plan.

5.7.7.1 Payment Adjustment

If Project Co fails to submit the Annual Asset Management Report(s) to the City in accordance with Section 5.7.7 within the first two weeks following each anniversary date of Substantial Completion, a Payment Adjustment of $200 will be assessed for each day or part thereof until the complete Annual Asset Management Report is submitted.

If the Annual Asset Management Report is incomplete then the Payment Adjustment will be applied until a complete Annual Asset Management Report is submitted.

5.7.8 Computerized Maintenance Management System

Project Co is responsible for providing, installing and maintaining a new CMMS for the Infrastructure utilizing data management software and platforms that are compatible with plant control system and the PCS. The system shall be utilized for the following activities at a minimum:

- Record repair, renewal and replacement of the Infrastructure on a detailed, item-by-item basis;

- Schedule, monitor, report and control Project Co's predictive, preventive and corrective maintenance programs;

- Schedule, monitor, report and control consumables;

- Create a historical database to be used to track and predict equipment performance and potential equipment failure;

- Monitor and control completion of tasks;
- Maintain and control a spare parts and materials inventory system;
- Manage equipment inventory utilizing an asset numbering system;
- Generate work order reports;
- Generate work completion reports;
- Track repair warranties;
- Track equipment failures by failure type;
- Generate repair priority reports and issue equipment status;
- Integrate into other managed asset functions such as operations, laboratory and administration; and
- Generate management summary reports, life cycle costs and personnel utilization reports or have the capability to export data in the reporting system for these parameters.

5.7.9 Planned Maintenance

Project Co shall submit no later than four weeks before Substantial Completion and thereafter four weeks before each anniversary date of Substantial Completion during the Term to the City for the City's review, the details of any planned maintenance of the Infrastructure planned for the year following Substantial Completion or the anniversary date of Substantial Completion, as applicable (the "**Proposed Planned Maintenance**").

The Proposed Planned Maintenance shall be subject to the City's approval, acting reasonably. It shall be reasonable for the City to withhold its approval of the Proposed Planned Maintenance if:

- Project Co has not provided in the Proposed Planned Maintenance a detailed risk assessment to demonstrate that the timing, duration and contingency measures proposed for the planned maintenance, satisfactorily reduces the risk of an Performance Failure from occurring;
- A planned maintenance activity exceeds 12 hours; or
- A planned maintenance activity reduces the Available Capacity of any part of the Infrastructure by more than 25% of the Design Capacity.

For Proposed Planned Maintenance activities that may affect End-Users, Project Co shall submit to the City a detailed work plan, including procedures, roles and responsibilities, hazard/risk analysis, contingences and timelines. O&M activities that require temporary shutdown of service

to the End-Users shall be subject to the City's approval, acting reasonably and following Good Industry Practice. Project Co shall obtain a formal notice to proceed from the City prior to the commencement of such O&M activities in accordance with the work plan. The City has the authority to withdraw a notice to proceed at any time, including before and during a planned shutdown, if the City determines that the operational situation has changed, including, for greater certainty, as a result of the occurrence of a wet-weather event, so that the City is required to restore the service to the End-Users. Upon the withdrawal of a notice to proceed in accordance with this Section 5.7.9, Project Co shall use commercially reasonable efforts to restore the service to the End-Users as soon as possible.

The Proposed Planned Maintenance that has been reviewed by the City shall be called the "**Approved Planned Maintenance**".

When a planned maintenance activity is being carried out in accordance with the Approved Planned Maintenance, the Available Capacity may be reduced to the extent and duration set out in the Approved Planned Maintenance.

During a planned maintenance activity that is being carried out in accordance with the Approved Planned Maintenance, the capacity deductions as set out in Section 5.7.5 shall not apply. However, if;

- The Available Capacity is reduced by more than the amount set out in the Approved Planned Maintenance; or

- The duration of the planned maintenance activity exceeds the time set out in the Approved Planned Maintenance, then the planned maintenance activity shall be deemed to be Unplanned Maintenance and the provisions of Section 5.7.10 shall apply.

5.7.10 Unplanned Maintenance

Any emergency works carried out by Project Co to rectify any Performance Failure shall not be deemed to be Unplanned Maintenance, provided that the works are performed in accordance with the procedures set out in the Operation and Maintenance Plan and the Emergency Response Plan.

5.7.11 Materials and Workmanship

Project Co shall ensure that all materials, and all repairs, replacements and renewals carried out by Project Co as part of its operations and maintenance obligations under this Section 5 shall, unless otherwise specified herein, be of the same quality as the standards and criteria set out in the Works Requirements and Project Co's Designs and the Detailed Designs, taking into account advancements in materials development and Good Industry Practice at the time of replacement or renewal.

Where parts, systems or components need to be replaced, they shall be replaced with new parts, systems or components. No used or reconditioned parts, systems or components shall be used without the prior written consent of the City.

6 HANDBACK REQUIREMENTS

6.1 GENERAL

This Section 6 sets forth the minimum requirements for handback of the Infrastructure at the end of the Term, including exit plans, procedures, standards and reporting.

In addition to the obligations set out in Section 10 of the Agreement, Project Co shall implement the requirements of the Transition Out Plan.

6.1.1 Payment Adjustment

If Project Co fails to perform all of the tests, procedures and activities set out in the Transition Out Plan prior to 90 days before the end of the Term, a Payment Adjustment of $5,000 per day shall be assessed until all of the requirements of the Transition Out Plan have been implemented in full.

6.2 HANDBACK REQUIREMENTS

At the end of the Term, Project Co shall comply with all record and document retention requirements set out in Section 16.3 of the Agreement and handback the facilities to the City in a condition that meets or exceeds the requirements listed below and the Infrastructure shall:

- Fully comply with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines and Permits and Approvals;
- Include furniture items of a similar quantity and quality to those transferred to Project Co on the date hereof;
- Be in good condition and operating order, excluding Reasonable Wear and Tear, and shall not have any structural faults or defects; and
- Be in a condition such that the Infrastructure (including, for greater certainty, any Existing Facilities included in the Infrastructure) shall continue to function in accordance with the Technical Requirements, Project Co's Designs and the Detailed Designs subject to Reasonable Wear and Tear for a period of five (5) years beyond the end of the Term with no requirement for capital expenditure provided that the Infrastructure is operated and maintained from the expiry of the Term in accordance with Good Industry Practice.

6.3 HANDBACK TEST PROCEDURES

6.3.1 General

Project Co shall perform and record the handback test procedures in accordance with the Transition Out Plan including:

- The Annual Dependability Tests;
- The proper function of the standby power systems;
- Calibration of all permanent instrumentation (including laboratory instruments); and
- Any other tests set out in the Transition Out Plan to demonstrate that the Infrastructure complies with the Technical Requirements.

The quality performance of the Infrastructure shall be demonstrated through the routine Treated Wastewater test results (set out in Section 5.6.4.2). The results of these tests shall be documented over a period of 28 consecutive days and shall be performed and delivered not earlier than 180 days and not later than 90 days prior to the end of the Term in the format set out in the Transition Out Plan.

The Infrastructure will be deemed to have passed the handback tests if the results for every parameter comply with the Technical Requirements and the test standards and criteria identified in the Transition Out Plan and in accordance with Project Co's Designs and the Detailed Designs, and all components and systems operate successfully throughout the tests in automatic control without any Unplanned Maintenance or other unplanned operator intervention.

6.3.2 Monitoring Requirements

All Treated Wastewater sampling and analysis carried out during the handback tests shall be carried out in accordance with the procedures set out in the Wastewater Sampling and Analysis Plan. A split sample of all of the Treated Wastewater samples taken during the test shall be provided to the City for independent analysis if so required.

6.4 HANDBACK STANDARDS

The ability of the Infrastructure to meet the Technical Requirements shall be demonstrated during handback testing, including demonstration of the following:

- The facilities operate properly with only the normal complement of employees included in the Staffing and Training Plan, with the exception of additional Project Co staffing deployed specifically to perform the handback test activities;
- The Infrastructure complies with the requirements of any applicable Governmental Authority, Applicable Law, Standards and Guidelines, the Effluent Standards and Permits and Approvals at all times;
- The O&M is consistent with the Agreement standards throughout; and

- The facilities operate properly in automatic control, including automatic shut-down and startup of equipment as intended in Project Co's Designs and the Detailed Designs.

6.5 HANDBACK REPORT

The handback report(s) shall be prepared in accordance with the Transition Out Plan and the handback test procedures set out therein and shall include at a minimum:

- A certification that testing was conducted in accordance with the accepted handback test procedures and standards;
- A certification of the results of the testing with respect to each of the handback test procedures and standards, each of which shall be addressed separately and the basis for the determination presented and this certification of results of the testing shall include a determination of the extent to which the facilities comply with the applicable performance requirements;
- All data measured and recorded during the handback tests including laboratory analyses, instrument calibrations and measurement;
- All calculations used in determining test results;
- Record of equipment outages, failures and preventative maintenance performed during the handback tests;
- Incident Logging Centre records for the period of the handback tests; and
- Any other data reasonably requested by the City to be included in the report.

All certifications shall be signed and sealed by the Project Co Engineer of Record.

6.5.1 Payment Adjustment

If Project Co fails to submit any handback report(s) prior to 90 days before the end of the Term, then a Payment Adjustment of $1,000 per day or part thereof shall be assessed until the completed report is submitted and reviewed by the City.

6.6 HANDBACK TEST FAILURE

Any failure to meet handback test procedures and standards during the handback testing shall require the failed handback test to be repeated. Failure to continuously demonstrate the handback test procedures and standards during the period of the handback tests shall constitute a failure of the handback test. Any failure of a handback test shall require: (i) correction of those components or conditions that resulted in the failure; and (ii) performance of a repeat of the handback test after proper notification is provided to the City.

6.7 FINAL EVALUATION

Before the end of the Term, Project Co shall provide the City with a full set of asset management data including, but not be limited to, the following:

- Up to date asset inventory;
- Complete set of asset performance data of the Infrastructure;
- Complete CMMS records of repair, renewal and replacement for the Infrastructure;
- Current asset condition status;
- Current spares inventory status;
- Project Co's current asset predictive and preventive maintenance programs; and
- An updated list of recommended spare parts requirements at the end of the Term.

6.7.1 Payment Adjustment

If Project Co's asset spares inventory is incomplete, evaluated against the recommended spares list set out in the O&M Manuals, then a holdback will be applied, equivalent to the Independent Inspector's estimate of the value of the inventory shortfall.

If Project Co fails to submit the full set of asset management data listed in Section 6.7 then a Payment Adjustment of $500 per day or part thereof shall be assessed until the complete asset management data is submitted to the City.