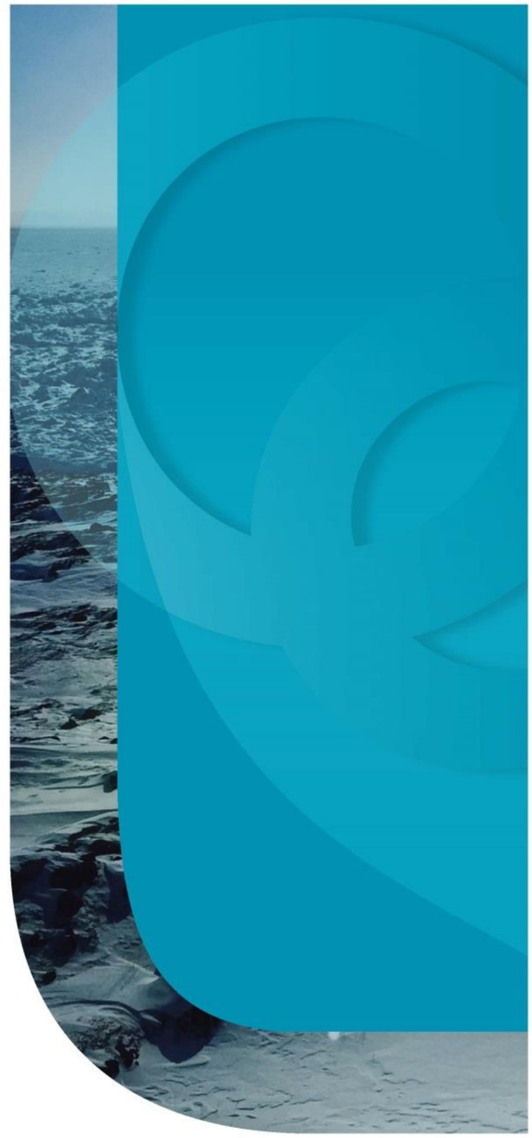
QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

IQALUIT INTERNATIONAL AIRPORT IMPROVEMENT PROJECT

FINAL



Mr. Michel Boulianne, M.Sc.
Enviromental Advisor
Sintra Inc.
9975 de Châteauneuf Street, Office B
Brossard, Quebec J4Z 3V6

March 24, 2017

O/Ref.: QE15-110-8

Confidential and priviledged document

Qikiqtaaluk environmental

Quality Assurance / Quality Control Program

Iqaluit International Airport Improvement Project

FINAL

Privileged and confidential document presented to

SINTRA INC.

Prepared by:

Greg Johnson, P.Eng., M.Sc.A.
Project Director

Qikiqtaaluk environmental
ᕿᑭᖅᑖᓗᒃ ᐊᕙᑎᓕᕆᔩᑦ

March 24, 2017

O/Ref.: QE15-110-8

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

CCME	Canadian Council of Ministers of the Environment
H&S	Health and safety
PMP	Project Management Plan
QA/QC	Quality Assurance / Quality Control
TQM	Total Quality Management

1. SAMPLING METHODOLOGY AND QA/QC

Sampling, transportation and storage procedures of soil samples will all be performed following methodologies set out in the various CCME guidelines regarding environmental work. QE field staff who will conduct all soil sampling will maintain the field notebooks and/or field sheets to record the location and number of each sample collected. The technician will use disposable gloves to collect soil samples, and will change gloves and clean any reusable sampling equipment each time to avoid cross-contamination between samples. Chain of custody documents will always be sent with samples to the external laboratory and will contain: date of sample submission, sample number(s), sample matrix, analysis type, signature, etc. The soil samples will be stored in coolers, with an ice pack, at a temperature in the range of 4°C until they arrive at the laboratory. The samples will be sent to the analytical laboratory by plane as soon as possible following sampling.

A minimum of 20% of field duplicates will be collected, and 10% of the duplicate samples will be analysed to confirm field sampling procedures. The plan will also include field and transport blanks for each sampling sequence. The analytical laboratory also applies its own QA/QC program on all analytical procedures.

2. PROJECT MANAGEMENT PLAN

2.1 General

QE's Project Management Plan (PMP) defines how the project will be executed, monitored, and controlled during the delivery stage. It is based on:

- The project objectives and supplier statement of work;
- QE's Technical Field Procedures Manual;
- QE's Internal Project Management administrative procedures.

The project management structure chosen for a project can greatly influence its outcome; therefore it must be adapted to the project size. QE utilizes simple structures that facilitate and consolidate information transfer.

2.2 Quality Management

Quality is the most important attribute QE offers its clients - quality in service, in deliverables, and in working relationships. This quality of services has resulted in a list of repeat clients, as well as the success and growth of QE.

To achieve and maintain the highest quality standards, QE has implemented a Total Quality Management (TQM) philosophy. The knowledge and understanding of personnel working on the project is very important to its success. All personnel must follow technical field procedures and project management administrative procedures. These procedures, developed internally by senior technical personnel based on ISO 9000 Quality Standards, are updated on a yearly basis. All QE personnel obtain initial training on their use, followed by annual refresher training on procedure updates.

The resulting benefits of the TQM program are:

- The establishment of rules that ensure compliance with project requirements and intent for the benefit of the client/stakeholder;
- Open lines of communication between all project participants, resulting in a better working relationship, a clearer understanding of the project parameters, and a quality project;
- The prompt, economical completion of the project by "doing it right the first time".

Errors, omissions and delays in the work will be avoided by quality control processes. However, in the unforeseen event that a mistake, error or omission is detected, Sintra will be quickly notified and provided with an agreed upon timely and cost efficient solution.

All documents presented by QE will be reviewed by at least 2 members of our team, one of which will be a senior member, with draft copies submitted for comments before the final copy of the work is officially presented.

2.3 Risk Management

Project risks, large and small, are identified, analyzed, and prioritized. All project risks, which have the potential for causing delays and cost overrun, are managed through technical processes, as well as contingencies in work scheduling and budgeting.

Other specific risks related to H&S (accidents and incidents) and environmental protection (spills) also have the potential of causing project delays. These risks are taken into consideration in QE's Environment, Health and Safety plan, which will be adapted for site specific conditions.

2.4 Sampling and Quality Plan

Sampling, transportation and storage procedures of soil samples will all be performed following methodologies set out in the various CCME guidelines regarding environmental work, and the *Guideline for Contaminated Site Remediation* by the Government of Nunavut Department of Environment.

2.4.1 Sampling Methodology

QE field staff who will conduct all soil sampling will maintain the field notebooks and/or field sheets to record the location and number of each sample collected.

Chain of custody documents will always be sent with samples to the external laboratory and will contain the following information:

- Date of sample submission;
- Sample number(s);
- Sample matrix;
- Analysis type;
- Signature, etc.

The soil samples will be stored in coolers with ice at a temperature in the range of 4°C until they arrive at the laboratory. The samples will be sent to the analytical lab by plane. The lab offers a pick-up service directly from the airport.

2.4.1.1 Soil

For excavation characterization, soil samples will be composed of 5 distinct samples for each sampling grid. A minimum of 1 soil sample for every 25 m^2 (25 m x 1 m deep) will be collected from each excavation wall and at least 1 sample per 625 m^2 (25 m x 25 m) will be analyzed from each excavation bottom. Sampling will be carried out according to the encountered stratigraphy and organoleptic observations with maximum sampling intervals of 1.00 m in thickness (without overlapping stratigraphic units).

Soil samples submitted for chemical analyses will be selected based on visual or olfactory observations made in the field (texture, color, smell, presence of debris). The excavation samples will be collected using the excavator bucket. The technician will use disposable gloves to collect soil samples and will change gloves each time to avoid cross-contamination between samples.

2.4.1.2 Water

For water sampling the samples will be collected from an area in the water body that provides the best representation of the water to be sampled. To accomplish this water samples will be collected as close to the centre of the water body as possible, and samples will be taken at the centre of the water column. New containers will be used at each sampling point, and the water will be poured into the sample bottles and filled according to the instructions from the laboratory.

2.4.2 QA/QC Plan

A minimum of 10% of field duplicates will be collected to confirm field sampling procedures. The plan will also include field and transport blanks for each sampling sequence. The analytical laboratory also applies its own QA/QC program on all analytical procedures.

IQALUIT OFFICE

2027 Iqaluit Lane
P.O. Box 1228
Iqaluit, Nunavut X0A 0H0

T.: 867 222.8194
info@qenv.ca

MONTREAL OFFICE

9935 de Châteauneuf Street
Entrance 1 – Suite 200
Brossard (Québec) J4Z 3V4

T.: 866 634.6367
info@qenv.ca

www.qenv.ca