APPENDIX 2-II

QUALITY ASSURANCE AND QUALITY CONTROL

TABLE OF CONTENTS

SECTION **PAGE**

1 INTRODUCTION

Data used in support of Environmental Impact Assessments (EIAs) must be of sufficient quality to ensure that the conclusions are not compromised. Established and proven Quality Assurance and Quality Control (QA/QC) procedures have been applied to the completion of the Christina Lake Regional Project – Phase 3 (the Project). These procedures were implemented to ensure that the data collected are of known, acceptable and defensible quality and that proper procedures (e.g., database management, electronic file management, document control, report reviewing procedures) were followed.

An overview of the components of the QA/QC procedures and overall objectives are presented below:

- use of standardized field sampling protocols for the EIA including:
  - relevant Technical Procedures and Specific Work Instructions (SWIs) for baseline field activities;
  - established and consistent procedures for recording field data;
  - established and consistent procedures for sample handling including identification, preservation and transport; and
  - proper health and safety procedures.
- selection of accredited laboratories to ensure high-quality analytical data; and
- application of established and rigorous documentation management processes including:
  - data entry, database management and audit procedures;
  - document control procedures (e.g., coding, version control, back-up management and safe storage of documents related to the Project); and
  - document review procedures.

The Project team includes a management team to oversee the entire Project and a technical team for each component of the Project (i.e., wildlife, water quality). Each component has a Component Lead who ensures their component meets all its objectives. The component-specific issues, technical approach and scope of work for each component of the EIA are described in detail in the corresponding sections of this Application. Component Leads were responsible for ensuring compliance with the QA/QC procedures.

2 FIELD PROCEDURES

The following sections describe the field procedures, including protocols for field methodology, audits, record keeping, sample handling (i.e., sample identification, preservation, sample QC, shipping) and health and safety. Field procedures are developed with consideration of recognized regulatory guidelines and requirements.

2.1 FIELD METHODS

Technical Procedures are detailed sampling protocols used by field personnel to ensure sampling techniques are standardized and defensible. Established Technical Procedures were used for most field sampling programs; however, where alternate methods were used, they are described in detail in the appropriate section of the EIA.

Specific Work Instructions (SWI) were also used for field sampling programs. The SWI includes: project personnel; details of where and when to sample; specific sampling instructions (including reference to relevant technical procedures); level of effort required; schedule for the fieldwork; site map; and any applicable contingency plans.

2.2 FIELD RECORD KEEPING

The Field Crew Lead was responsible for ensuring that all pertinent information on field activities and sampling efforts were recorded in the appropriate data sheet and/or in a waterproof bound logbook. Field notes and datasheets were coded and stored within each component's filing system. A tracking sheet of these file locations was kept in the Project master file.

2.3 SAMPLE HANDLING

Sampling protocols (including sample identification, preservation, sample QC and storage), selection of sample containers and the amount of material collected followed detailed Technical Procedures and the requirements of the analytical laboratory (e.g., sample volumes or weights). The laboratory requirements, as well as sample containers and preservatives, were provided by the selected laboratory based on the parameters to be analyzed and the required detection limits.

2.4 SAMPLE SHIPPING

Sample shipping required the use of Chain-of-Custody (COC) forms, which documented the travel of samples from the field crew's possession to the laboratory log-in. Chain-of-Custody forms provide a complete list of the contents of the shipment (i.e., sample codes), dates and times samples were collected, analysis requested, shipping information and possession history of the shipment.

Sample containers were securely packed inside a cooler with appropriate packing materials and ice packs before shipping. The original signed COC forms were placed in a zip-locked bag inside the cooler. The field Crew Lead maintained a copy of the COC documentation. Samples were transported from the sampling area to the selected laboratory by an authorized carrier as soon as possible after collection.

The COC form was completed when the container arrived at the laboratory and the log-in personnel recorded the date, time and condition of the sample arrival. The laboratory was aware of the sampling date and time to ensure that analysis was completed within the specified time limits.

2.5 HEALTH AND SAFETY

Each field program for the Project required a detailed Health and Safety Plan (HASP) to be completed by the Crew Lead, which was then reviewed and approved by the Component Lead, the Project Manager and the Project Health and Safety Administrator. Completed HASPs contain site-specific information (including site map(s) and Universal Transverse Mercator [UTM] co-ordinates), field personnel contact information, emergency information, field level risk assessment, emergency call down procedure, pre-field meeting notes, tail-gate meeting notes, check-in logs and a blank incident/accident report form. At the end of each program a post-field debrief meeting between the Project Health and Safety Administrator and the field crew was conducted and noted in the HASP. Relevant information (including hazard identifications) was communicated to other crews working in the areas and the completed HASPs were filed in the Project Master File. Any near misses or incidents were reported immediately to Golder's Health and Safety department as well as to MEG Energy Corp (MEG).

3 LABORATORY PROCEDURES

Only laboratories accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL) were selected to complete analysis of samples for the Project. Under CAEAL's accreditation program, a performance evaluation assessment is conducted annually for the laboratory's procedures, methods and internal quality control. Laboratories were also required to provide written protocols for the analytical methods used, including the target detection limit for each chemical tested.

The COC form provided clear instructions to the laboratory on the analysis requested for each sample. Samples were identified and tracked by means of sample location (station) and replicate identifiers. Any transfer of samples between or within laboratories was tracked through COC procedures.

Laboratory quality control criteria included analysis of QC samples. Field blanks were used to evaluate the effects of collection, handling and analysis of samples on data quality. Duplicate samples were used to evaluate the precision of the sampling method and laboratory results. All excess sample materials were archived by the labs for future reference.

Upon receipt of the laboratory results Component Leads reviewed the data sets. Concentrations in blank samples greater than five times the analytical detection limit in the field blanks were considered to indicate the possibility of contamination. Duplicate measurements with a difference greater than 20% were considered to signal a possible error in analysis. In these instances sample re-runs were requested, or potential errors were considered when interpreting the data.

4 DOCUMENTATION

4.1 DATA MANAGEMENT

At the end of each of program, data sheets were reviewed and checked for completeness by the relevant Component Lead or designate. Prior to data entry, analysis and output requirements were reviewed to ensure the database conformed to the necessary specifications. Upon completion of entry into the database, data entries were checked against the original data sheets. Ten percent of the data entries, or a minimum on one hundred entries were checked for every dataset.

A management system for data control and filing was used for the Project. This system ensured that the most current information was stored in a single location for use by team members. This practice ensured efficient QA/QC procedures and was available to other teams and the client as required.

Each component was assigned an electronic project directory. Subdirectories were named by the task code number and title. Data files within the subdirectories were named according to content and date of revision. Files were archived as they became either outdated or redundant to ensure that all files were current.

4.2 DOCUMENT CONTROL

The Project produced large quantities of written material, including correspondence, field data, data reports from laboratories, documentation of analysis and reports. The document control system operated as follows:

- Field records, materials and reports received or produced in-house were dated, coded and filed according to the relevant task.
- Copies of documents transferred to subconsultants or the client were photocopied along with the accompanying transmittal were stored in the Project master files.
- Documents received from external parties such as subcontractors or the client were logged in an incoming documents ledger and filed in the Project master files.
- The Project master files were maintained by the Project Management team and located in a locked file with restricted access. Draft Project reports and application sections were completed by Component Leads and reviewed by a Senior Advisor in the relevant discipline before

submission to the Project Management Team for the final review process.

4.3 FINAL REVIEW AND DOCUMENTATION PROCESS

The final Project application is a compilation of several independent sections, reports and appendices. As stated above, each section submitted to the Project Management Team were reviewed first by the Component Lead and then by a Senior Advisor. Once received by the Project Management Team each document underwent an extensive review and documentation process including:

- complete document format including, for example, correct headings and page layouts;
- technical review of each section for consistency and compliance with Project-specific conventions;
- complete check of references, cross-references, tables and figures;
- complete review by the Project Manager and/or Project Director as appropriate;
- review by the MEG representatives;
- review of all comments and edits received from MEG representatives with document authors to ensure technical content is not compromised; and all questions and comments are addressed; and
- final review and approval by technical Senior Advisor, Project Manager, Project Director and the MEG representatives.

This review process was managed and documented by the Project Coordinator. Electronic and paper copies of each report were archived as they were superseded and a single current version was made available for each step of the process. A QA/QC check of the edits and changes incorporated was completed at each stage of the process. A tracking sheet was completed for each document stating the dates each step was completed and by whom. All comments provided by MEG representatives are kept on file.