C.0463

PROPOSAL

FOR THE REMEDIATION

OF

PAH CONTAMINATED SOIL AND WATER

SUBMITTED TO:

CENTRA GAS MANITOBA INC.

SUBMITTED BY:

MID CANADA SOIL TREATMENT LTD.

IN ASSOCIATION WITH

HOBBS MILLER MAAT, INC.

MAY 14, 1996

CENTRA GAS MANITOBA INC.
REMEDIATION OF PAH CONTAMINATED SOIL AND WATER

TABLE OF CONTENTS

CENTRA GAS MANITOBA INC.
REMEDIATION OF PAH CONTAMINATED SOIL AND WATER

1.0 INTRODUCTION AND PROJECT BACKGROUND

Mid Canada Soil Treatment Ltd. is pleased to provide this proposal relataed to the remediation of PAH contaminated soil and water resulting from a construction project at the Centra Gas facility located at 35 Sutherland Avenue. Our tender is presented in response to the "Invitation to Bid" issued by AGRA Earth & Environmental Limited. The work contemplated in the bid document involves treatment and disposal of contaminated soil, groundwater, rubble, and confirmatory sampling and analysis upon project completion.

This proposal outlines a proprietary bioremediation process developed by Hobbs Miller Maat, Inc., in conjunction with ESP Corporation of Arlington, Texas. It is based on a unique combination of surfactants, nutrients and microbes. The combination of these distinct products has been formulated to address recalcitrant contaminants which historically have not been "biodegradable" with indigenous and / or selected strains of microbes.

Surfactant Had previously requested info on composition of the surfactants / materials!

The HMM Surfactant ESP Pro has been specifically formulated to separate contaminants from soil particles to increase and enhance their bioavailability, and to break the molecular structure and bonds of the contaminants to facilitate their breakdown by intracellular and extracellular biological enzymes and eventual degradation by the microbes to carbon dioxide and water. The surfactants have been developed in oilfield applications where the separation of crude oil from clays and breakdown of molecular bonds was required. The surfactant, where required, is augmented with clay destabilizer to break down and separate clay soils to make them amenable for treatment.

Nutrients - Need to see anticipated [N,P] in treatment method.

HMM, in conjunction with ESP Corporation, have developed proprietary nutrient formulations based on macronutrients (N,P) and micronutrients specifically developed to stimulate the selected strains of microbes introduced into the soil.

Microbes Need species IDs.

HMM / ESP have selected and developed several strains of microbes identified as having the ability to degrade recalcitrant organic contaminants ranging from petroleum hydrocarbons, PCB's, and creosotes, to chlorinated organics such as TCE, PCE and many others.

The combination of the selected microbes with nutrient formulation and surfactant pretreatment has resulted in an integrated biochemical approach that has been able to treat a wide range of contaminants, reduce the treatment time, and significantly improve the performance efficiency at a cost significantly lower than other treatment options.

2.0 SCOPE OF WORK

The scope of work for this project is based on the "Invitation to Bid", and is summarized as follows:

2.1 Temporary Facilities

The work will be undertaken at the Mid Canada Soil Recycling Centre, located in the Rural Municipality of Macdonald. Mid Canada will provide all temporary facilities required for the work, including:

- temporary power, and
- a secure synthetic liner in areas of soil preprocessing.

2.2 Permits

Mid Canada is currently licensed to receive and process the contaminated soil and water currently in storage at the recycling centre. Further to this, Mid Canada has submitted a proposal to Manitoba Environment to apply the HMM process to remediate the soil and water, as outlined in Appendix "A".

2.3 Health and Safety

Mid Canada will provide a detailed Site Specific Health and Safety Plan prior to commencing any onsite work activities. In addition, Mid Canada supervisory staff will provide onsite health and safety training for personnel employed in the undertaking of the work.

2.4 Work Plan

MB Env. to conduct sampling & analysis program as well.

Mid Canada will prepare a detailed Work Plan outlining each phase of the work. The Work Plan will include a sampling and analysis program which will assist in determining when remediation criteria have been achieved.

2.5 Soil Management

Mid Canada will provide sampling and analytical data throughout the treatment process to determine the rate of contaminant degradation. Once the soil treatment has reached levels consistent with CCME commercial / industrial criteria, the soil will be transferred to the municipal landfill for use as cover material. All necessary documentation will be provided, and approval will be received from Manitoba Environment prior to soil disposition.

2.6 Rubble Management

The rubble contained in the soil mass consists primarily of waste concrete and brick. This material will be screened and separated from the soil, and washed with a high pressure washer. Collected washwater will be used as a reagent additive in the soil treatment process. Once leachate tests have determined that the material is suitable for disposal, the rubble will be transported to the munincipal landfill.

2.7 Contaminated Water Management

Mid Canada has a requirement to use approximately 50,000 litres of water in the treatment process. As a result, it is anticipated that approximately 12,000 litres of water will require onsite management.

2.8 Stormwater Management

Mid Canada will ensure that all process areas are bermed and tarped to ensure that stormwater does not come into contact with contaminated materials.

2.9 Confirmation Sampling Plan

Once soil treatment has been completed, confirmation sampling will be undertaken to provide verification. Results will be forwarded to Manitoba Environment to obtain approval prior to the release of soil from the treatment area.

2.10 Report

Mid Canada will provide a full report upon completion of site restoration, outlining:

- summary of procedures utilized,
- summary of all laboratory test results, including sampling protocol and chain of custody records,
- listing of all subcontractors,
- description of site activities, including soil treatment processing and disposal details,
- description of QA / QC procedures,
- conclusions, and

other documentation as required by Manitoba Environment.

3.0 PROJECT EXECUTION

3.1 Project Data

The project will be undertaken utilizing HMM engineered biopile technology in conjunction with the HMM microbe package. The following assumptions have been made in determining project requirements:

- The total weight of contaminated soil and debris requiring treatment is estimated at approximately 902 tonnes presently stockpiled.

- It is estimated that the natural bed contaminated clay soils presently stockpiled weigh approximately 1800 kg / m^3 in-situ. Therefore 902 tonnes is the equivalent of 500 m^3. Upon removal from the stockpile for shredding, screening, and placement into the HMM engineered biopile a minimum 20 percent swell factor is expected. Therefore the total volume of soil requiring treatment will be approximately 600 m^3 , less the volume occupied by the rubble.

- The contaminated soils are described as compacted, dense, clay.

- It is understood that the soils are contaminated with PAH's in excess of CCME Industrial Criteria. The soil contamination ranges from 150 to 1000 mg/kg total PAH's. We further understand that the recovered groundwater is contaminated with PAH's in excess of levels allowable for discharge to local wastewater treatment plants. The recovered groundwater contamination ranges from non-detect to 250 ug/kg ?

- The potential contaminants of concern are the PAH's in the soil and the recovered groundwater. It is understood that heavy metals are not a POPC.

- The applicable remediation criteria for clean-up of the soils and groundwater is CCME Commercial / Industrial Criteria.

3.2 Engineered Biopile

3.2.1 Treatment Area, Electrical Power, Water

The HMM biopile aeration system will require constant power throughout the life of the project. In addition the HMM engineered biopile will require that a supply of on-site water be available throughout the life of the project. Costs to provide temporary power adjacent to the proposed HMM engineered biopile in addition to fresh potable water are therefore not included in this proposal.

Do we need to see some as-builts for this facility?

- we (I, I guess) should conduct site inspections during construction and treatment operations.

3.2.2 Biopile Engineering and Construction

HMM will engineer and construct the required engineered biopile to meet regulatory requirements of Manitoba Environment utilizing a 10 mil, oil resistant bottom liner, with all seams sealed, placed within the designated treatment area. Approximate engineered biopile dimensions will be 16 x 20 x 2 metres. Contaminated soils will be placed into the engineered biopile at a maximum total depth of approximately two (2) metres.

3.2.2.1 Walls and Floor

The biopile berms and floor will be constructed utilizing surrounding soil to form the perimeter. Coarse sand will be utilized as a protective layer on top of and under the bottom liner. A layer of approximately 70 mm. will be placed directly on top of the ground surface prior to the bottom liner placement, followed by a further 150 mm. of sand placed on top of the liner prior to the contaminated soils placement.

3.2.2.2 Bulk Construction

The biopile will be constructed in a progressive backfill operation to avoid soil compaction while under construction. The soil, as it is being shredded, will be treated with the surfactant by means of machine mounted spray bars or a manually operated spray gun. The soil, after being stockpiled for 24 hours, will be placed into the biopile at which time the nutrient / microbe solutions can be added by means of a tanker pumper spray unit. The aeration lines will also be placed in the soil as it is being placed into the biopile.

3.2.2.3 Biopile Cover - Aeration

A 10 mil sealed and water proof cover sheet will be provided to cover the complete biopile throughout the total treatment cycle, with. This will ensure containment of contaminated soils and protection from heavy rains and/or snowfall. Oxygen is a vital and integral part of the success of any biodegradation process. To ensure the correct volumes of oxygen are constantly provided to our microbials throughout the total treatment cycle, HMM utilizes an engineered forced air aeration system. Our system constantly and evenly distributes the correct amount of required oxygen throughout the soil.

The sizing of the aeration equipment is determined by the quantity and depth of soil contained in the biocell, the types of contamination and levels of contamination, the project remediation time frame, and most importantly the microbial demand. This proposal is based on an engineered biopile configuration complete with aeration piping and blowers.

3.3 Soil Processing

This proposal is based upon HMM processing soils prior to placement into the engineered biopile. Processing is to consist of screening and shredding soils utilizing a hammermill into the smallest particles possible - under 1-2 cm. The soils will be placed into the engineered biopile when ready for application of EN-101 Nutrient and EM-99 Microbial products.

Info? Info?

3.4 Excavation and Processing Equipment

Included in this proposal is the supply of equipment to excavate, break, shred, screen and place and remove the contaminated soils into and from the engineered biopile. HMM estimates that that soil processing and placement will cover a time period of approximately 8 to 14 days.

Upon completion of removal of the contaminated soils from the stockpile, confirmation samples from the base of the excavation will be obtained by HMM and analyzed following the excavation to ensure sufficient removal of the contaminants. The excavated soil will be processed, placed into the engineered biopiles, and sampled by HMM to determine the mean concentration of contaminants of concern.

3.5 Moisture Content and Drainage

Prior to the application of product and during the bioremediation process the moisture content of the contaminated soil must be maintained. The ideal level is 15 to 20%. If moisture is required to be added, HMM will apply a nutrient enriched solution as per EN-101C blending instructions. Water quality throughout the project should be free of any chlorine or chlorine derivatives, harsh alkali's or chemicals, acids, bactericides, pesticides or herbicides. There may be water buildup from time to time in the cell. Excess water will be collected and either treated in a separate tank or reapplied to the pile, having first been blended with nutrient, as moisture is required. For this project the recovered groundwater contaminated with PAH's will suffice as the carrier liquid for the biotreatment process. Approximately 50,000 litres will be required for the biopile.

3.6 Temperature

Temperature can affect the remediation time frame. Microbes work best above 7° C. although we have and will be applying cold weather microbes that function in -4° C. temperatures. If however, the contaminated soils freeze, our microbes become dormant. The engineered biopile approach will maintain soil temperature by means of retaining the heat from the exothermic biological reaction in the soil and from the recirculated warm air from the blower exhaust.

3.7 Bioremediation Products - Surfactants, Nutrients and Microbes

3.7.1 ESP Pro Surfactant

ESP Pro Surfactant is a substance that breaks the natural surface tension of liquids and, even in small quantities, can cause significant changes in the behavior of liquids. When introduced to a hydrocarbon base contaminant ESP Pro will penetrate and loosen the hydrocarbon contaminant from the soil, and cause the hydrocarbon contaminant to form in smaller particles enhancing degradation by our microbial products. In addition our ESP Pro Surfactant is 100% biodegradable in 28 days.

3.7.2 EN-101 - ESP Microbial Nutrient

EN-101 is a natural product formulated to enhance productivity of our microorganisms, ensuring rapid and complete bioremediation.

3.7.3 EM-99 - Microbial Hydrocarbon Digestant

Our biological products are live synergistic groups of petrophilic microbes which, when introduced to various forms of contaminants, digest those hazardous contaminants into simpler compounds in a series of chemical reactions, eventually reducing the compounds to carbon dioxide (CO_2) and water. They are formulated for the bioremediation of both contaminated soil and water, in conjunction with our custom designed bioremediation programs, and are not harmful to plants, animals or marine life. EM-99 reduces gasoline and diesel range TPH (Total Petroleum Hydrocarbon), BTEX (Benzene, Toluene, Ethylbenzene and Xylene) and BOD (Biological Oxygen Demand) and will also digest a wide range of long chain hydrocarbons including crude oil, coal tars, hydraulic fluids, phenols, oils and greases, phenolic compounds, chlorinated aliphatic solvents and many others.

3.8 Field Blending & Application Protocol

3.8.1 Equipment Requirements

HMM will utilize a 500 gallon polyethylene tank for blending HMM concentrated microbial products with water. In addition a volume adjustable pump with spray gun and probe for injection (if required), for application of HMM products will be utilized.

proposed surf N:P:[CONT.]?

3.8.2 Field Blending and Application Instructions

3.8.2.1 ESP Pro Surfactant Blending

ESP Pro C. is blended at a 1:30 ratio to make applicable product ESP Pro. The required amount of water is added to the field tank, depending upon its size, at a dilution ratio of 1:30 (1 parts surfactant to 30 parts water). The water is added first to avoid foaming. Both are then mixed thoroughly.

3.8.2.2 EN-101C Microbial Nutrient Blending

EN-101C Microbial Nutrient is blended at a 1:55 ratio to make applicable product EN-101. The required amount of water is added to the field tank, depending upon its size, at a dilution ratio of 1:55 (1 part nutrient to 55 parts water). Both are then mixed thoroughly.

3.8.2.3 EM-99 Hydrocarbon Digesting Microbe Blending

EM-99C Microbes are blended at (1) 240 ml bottle into 950 litres of water. The field tank is filled with the recommended amount of water. The EM-99 concentrate is then added and very gently agitated until all of the microbial mass and nutrient that has settled to the bottom has become soluble and thoroughly mixed. The microbes are now ready to be applied to the soil.

3.8.2.4 Product Application

Applying the diluted surfactant, nutrient, and microbial solutions to the contaminated soil(s) placed in the biopile can be accomplished utilizing a variety of methods. Once applied, the surfactant should be left to penetrate into the soil for 12 to 24 hours, after which time the nutrient and microbial solutions will be applied.

3.8.2.5 Weekly Nutrient Treatment

Nutrient will be applied to the soil through the top layer of infiltration piping. This application process will be repeated weekly, or as required until the contaminant has reached the desired remediation criteria level.

3.9 Analytical Program

Need to know who!

3.9.1 Independent Laboratory

HMM will utilize an independent laboratory to act as the project laboratory. Samples will be analyzed for concentrations of Polynuclear Aromatic Hydrocarbons.

3.9.2 Sample Protocol

For each 50 cubic meters of contaminated soil(s), one (1) sample composed of five (5) equal mass cell specimens (1 for every 10 cubic metres), will be collected. Each cell sample will be homogenized and split into two parts, with a composite sample being formed from the split. Each composite sample will be analyzed for Potential Contaminants of Concern (PCOC(s)). At random, two cell sample splits will be selected and analyzed individually for PCOC(s).

3.9.3 Sample Collection

Mid Canada personnel will be responsible for collection and delivery of all samples to the project laboratory. Samples will be composites as outlined above. Prior to application of HMM microbial products, Control Samples will be collected at the beginning of the treatment cycle. At the end of the treatment cycle Closure Samples will be collected. Control and Closure sample analysis will be for Polynuclear Aromatic Hydrocarbons.

3.9.4 Sample Results

The project laboratory will be expected to forward sample results within five (5) business days, as test procedures allow, directly to Mid Canada by facsimile with hardcopy to be mailed. Mid Canada will immediately provide results to the Project Manager upon receipt.

3.9.5 Closure Time Frame / Post Remediation Soil Use

Upon receipt of complete sampling analysis, a two to four week time frame should be expected for receipt of delisting approval. Upon receipt of delisting approval, the treated soils will be removed from the treatment cell and deposited in the adjacent R.M. landfill for use as cover material. The engineered biopile will subsequently be dismantled.

4.0 WORKER HEALTH AND SAFETY

4.1 Health And Safety

This section covers the safety plan requirements, and includes details concerning the site specific safety program. Mid Canada will be responsible for the successful coordination and implementation of the health and safety program, with assistance from Maat Environmental Engineering Corp.

4.2 Corporate Health And Safety

Mid Canada deals specifically with contaminated soils and liquids. The objective of our safety program is to preclude potential exposure to our personnel from hazardous situations found at project sites. Through careful planning, hazard recognition and control., safety indoctrination and training, and rigorous attention to safety procedures, Mid Canada ensures the health and safety of personnel at its work sites.

4.2.1 Major Elements Of Health And Safety Program

There are 4 major elements of the Mid Canada corporate health and safety program. These elements consist of the following:

- Employee medical monitoring
    - Initial employee screening with yearly follow ups
    - Ongoing medical consultant reviews
- Employee safety training
    - Respirator certification
    - Continuous project safety review
- Site hazard evaluation
    - Preparation of site-safety plans
    - Development of hazard potential, engineering, administration and protective equipment controls, and
- Emergency procedures and response capabilities.

The responsibility for ensuring that these elements are carried out rests with Mid Canada Soil Treatment Ltd.

4.2.2 Personal Protective Equipment

The required level of protection is defined as part of the site safety plan for every project. The required equipment may contain, but is not limited to, such items as:

- Safety boots/glasses/hard hats,
- Coveralls,
- Respirators/SCBA and
- Tyvek disposable suits.

Experience in defining safety requirements for waste management projects enables us to define, monitor and audit the safety requirements for each unique project, and train people to work in hazardous situations. The integration of these safety items ensures that the employee, client and general public safety are at the forefront of every project.

4.3 Employee Safety Training

Safety training is an integral part of Mid Canada's safety program. The following provides details relative to the safety training program adhered to by Mid Canada and its subconsultants.

4.3.1 Initial Safety Training

Initial safety training introduces new employees to the potentially hazardous and rigorous work associated with environmental restoration and response. Training includes chemical hazards, protective equipment, basic safety procedures, and company safety policies. Personnel are fit tested for respirators and receive basic training on all types of respiratory equipment and protective clothing used under simulated field conditions while wearing such protective equipment.

4.3.2 Daily Safety Training

Each day prior to beginning work on larger projects, there will be a morning safety meeting. The topics will typically include specific site hazards, decontamination procedures, dust control, and other precautions for that day's activities. A log of these meetings will be kept at the site, recording who attended, what was discussed, and who presented the training.

4.3.3 Pre-Job Training

Before work is begun at the site, there will be a pre-project training session. This training will cover both chemical and physical hazards associated with this particular project. Specific emphasis will be placed upon decontamination procedures, dust suppression methods, respiratory protection, personal hygiene and emergency procedures. A record will be maintained of personnel attending the training, topics covered, and personnel providing the training.

4.4 Site Specific Project Health And Safety Plan

Within 10 days of project award, a detailed health and safety plan will be developed and submitted for the project. The site-specific safety plan will be developed for each phase of work. The plan will include, but not be limited to potential protective equipment for each task, specific training requirements, personal hygiene practices, emergency procedures (fire/medical/spill), and subcontractor requirements.

The site specific health and safety plan will be read and followed by all personnel visiting or working at the site.

4.5 Personal Protective Equipment

Levels of contact and respiratory protection will be specified based on contact hazards which are present at the site, and levels of chemicals and physical agents present in the atmosphere. Four typical levels of protection have been established by the industry:

- Level D - Level D protection does not provide any special protection from chemicals or airborne contaminants and may be worn only in non hazardous situations or areas. This equipment is minimally defined as steel-toed work boots, hard hats, cotton or PVC work gloves, work clothes, hearing protection (if warranted), and eye protection.

- Level C or B - For work inside an exclusion zone, Level C or B will be required and consists of the following (when casual contact with liquids is anticipated); PVC splash suit (required for drum sampling or work with drummed liquids); Tyvek coveralls (when operations are taking place where only minor contact with dry materials is possible); steel-toes shoes/ boots; vinyl booties (equipment operators); vinyl sample gloves; PVC, nitrile, or Vinton gloves; wizard gloves (in addition to PVC gloves when barrel sampling); hard hat with face shield; cotton coveralls; and respiratory protection (Level C air purifying, Level B air supplied). All joints between the various garments will be sealed with vinyl duct tape.

- Level A - Level A protection consists of a fully encapsulating suit with attached gloves, boots, and headpiece, an air-supplied respirator (either air line or SCBA, depending on the situation), and Tyvek coveralls underneath.

In light of the above, Mid Canada feels that most work at the Mid Canada facility can be accomplished in Level C protection. After project award, this level of protection can either be upgraded or downgraded as appropriate, following discussion with appropriate authorities.

5.0 QUALIFICATIONS AND EXPERIENCE

5.1 Mid Canada Soil Treatment Ltd.

Mid Canada Soil Treatment Ltd. is a Winnipeg based company, operating two contaminated soil recycling centres located in close proximity to the City, both fully licensed by Manitoba Environment. The company has traditionally focused its attention on the remediation of petroleum contaminated soils. With its presence in the environmental industry, and with the added advantage of owning and operating soil recycling facilities in Manitoba, Mid Canada is developing into a leader in its field through the development of relationships with environmental firms possessing specific expertise. Projects currently being pursued address the remediation of PAH and creosote contaminated sites, and the relationship with Maat Environmental will expand its capabilities to the remediation of soil contaminated with inorganic materials.

5.2 Hobbs Miller Maat, Inc.

Hobbs Miller Maat Inc. (HMM), a Canadian company with opffices in Victoria and Toronto, is the exclusive Canadian representative for the processes, products and services of the Environmentally Safe Products Corporation (ESP) of Arlington, Texas.

ESP is a well established environmental services company and an industry leader in the research, development and application of biochemical products and processes to solve a wide variety of environmental problems. ESP has refined the microbial application process through development of the most effective specific microbial strains, powerful, 100% biodegradable surfactants, and a potent all natural microbial nutrient. In addition, ESP has propeietary oxygen sources and application methodology for use with microbial packages.

Like ESP, HMM is a results oriented environmental company offering state of the art analytical services, site assessment, fully guaranteed turnkey remediation programs, and complete support services specifically designed to meet environmental needs and budgetary guidelines.

An accompanying manual provides further information regarding HMM's capabilities and products is provided with this proposal.

6.0 PROJECT SCHEDULE

The proposed project schedule is presented in the following:

• Notice to award	May 17, 1996
• Mobilization	May 27
• Commence site activities	June 3
• Separate rubble from soil volume	June 3 to June 5
• Power wash rubble	June 6 to June 12
• Construct biopile	June 6 to June 12
• Screen and shred contaminated soil	June 10 to June 14
• Process soil with surfactant / microbes / nutrients	June 12 to June 18
• Placed processed soil in biopile	June 13 to June 24
• Obtain confirmatory soil samples	October 3
• Receive authorization to remove soil to landfill	October 16
• Provision of Final Report	October 23
• Project Completion	October 23, 1996.

7.0 PRICING SUMMARY

7.1 Bid Prices

Bid pricing has been developed in the following manner:

- Treatment of Soil to CCME Criteria

  This line item addresses all labour, materials, equipment and services required to remediate the soil to below CCME C/I remediation criteria. In addition, it covers costs associated with separating the rubble from the soil, and cleaning the rubble to meet landflil requirements.

- Removal of Treated Soil to Landfill

  This addresses the cost of receiving access to, payment of tipping fees, and transporting the processed soil to the landfill in the Rural Municipality of Macdonald.

- Addition and Treatment of Water in the Soil Remediation Process

  This line item includes all labour, materials, equipment and services required to add contaminated water to the reagent mixture, which wil subsequently be used in the treatment process.

- Treatment of Excess Contaminated Water to CCME Criteria

  This line item includes all labour, materials, equipment and services required to collect, remove, transport and dispose of the PAH contaminated water at a licensed facility, or alternatively, to process the water onsite to meet local disposal criteria, as approved by Manitoba Environment

7.2 Cost Inclusions

This turnkey ex-situ bioremediation proposal includes costs for:

- Systems design, bioremediation program and application protocol;
- Supply of all necessary equipment for removal, shredding, screening, placement, and aeration of soils, product mixing and application, and construction of the engineered biopile;
- Separation and cleaning of rubble;
- Onsite processing of excess contaminated groundwater;
- Sample collection, delivery and reporting as specified; and
- Guarantee of project closure meeting CCME remediation criteria with respect to PAH contamination.

7.3 Cost Exclusions

This turnkey ex-situ bioremediation program does not include costs for:

- Treatment or removal of any metals in the soil; and
- Disposal of contaminated rubble should the high pressure rinse process not be an effective treatment option.

7.4 Insurance

Mid Canada confirms that, if successful in its tender, insurance coverage will be provided as outlined in the Invitation to Bid.

7.5 Terms and Conditions

This proposal and prices quoted are based on information as supplied to HMM by AGRA E & E, and as outlined in each section of this proposal. If conditions as outlined in this proposal are found not to be as described, this may result in a less than favorable bioremediation process. If such occurs and factors are found to be inconsistent with the conditions as outlined in this document, HMM cannot guarantee the performance of our products.

7.6 Performance Guarantee

This proposal is based on the total reduction of contaminant concentration limits to CCME Closure Remediation Criteria relating to PAH contamination. HMM guarantees to achieve contaminant concentration limits as outlined by CCME.

In the event that HMM does not meet CCME Closure Remediation Criteria within the stated Project Time Frame(s), HMM will continue the remediation process and guarantees to meet Closure Remediation Criteria, at no additional expense to the client, other than the Total Project Cost.

In the event that the process proposed by HMM and Mid Canada does not meet Closure Remediation Criteria, we guarantee to meet Closure Remediation Criteria, at no additional cost to the Client, other than the Total Project Cost. If bioremediation is not successful, HMM / Mid Canada will inform the Client in writing, and further agrees to either employ alternative technology to treat the soils to the specified level, or to transport and dispose of the soils at a waste management facility licensed to accept hazardous waste. If bonding is required as per the terms of the Invitation to Bid, this performance guarantee will be supported by a Performance Bond with a major Canadian Insurance Surety Company, for 100% of the project cost.

7.7 Payment Schedule

The following provides proposed payment terms:

- 40% of the total contract value payable within 10 days from contract signing;
- 30% of the total contract value, to be invoiced at commencement of remediation; and
- Final payment of the remaining 30% of the total contract value following confirmation through closure sample results that remediation of the soil to below CCME Commercial / Industrial criteria has been achieved.

HMIN PROCESS.

BIDDER CERTIFICATION

The name of the Bidder submitting this Bid is
MB CANADA SOIL TREATMENT LTD., doing business at
89 CLIFFWOOD RD. WPG., MB., R2J 3N2
Street City Province Postal Code
which is the address to which all communication concerned with the Bid and with the Contract Documents shall be sent.

The names of the principal officers of the corporation submitting this Bid, or of the partnership, or of all persons interested in this Bid as principles are as follows:

JOHN S McCABE, P.ENG. — PRESIDENT
BILL ORMUCKLE — VICE PRESIDENT
COLLEEN MURRAY — SECRETARY

IF SOLE PROPRIETOR OR PARTNERSHIP:
IN WITNESS hereto the undersigned has set his (its) hand this _____ day of _____, ____

_____
Signature of Bidder

_____
Title

IF CORPORATION:

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and it's seal affixed by its duly authorized officers this 14 day of MAY, 1996

(seal)

MB CANADA SOIL TREATMENT LTD.
Name of Corporation

By _____
Title VICE PRES.
Attest _____
Secretary

BID FORM

To: AGRA Earth & Environmental Ltd.
ATTN: Mr. Harley Pankratz
95 Scurfield Blvd.
Winnipeg, Manitoba
R3Y 1G4

Project Title: Centra Gas PAH Remediation Project
Bidder: MB CANADA SOIL TREATMENT LTD.
Address: 89 CLIFFWOOD DR.
WPG. MB. R2J 3N2
Date: MAY 14, 1996

Bidder's Contact person for additional information of the Bid:

Name: JOHN McGABE
Telephone: (204) 255-3932

LUMP SUM BID ITEMS

Mobilization/Demobilization $5,000.00

Fixed Set-up Costs _____

Final Report: 4,000.00

TOTAL LUMP SUM COST $9,000.00

Amount Written Nine Thousand dollars.

UNIT PRICE ITEMS

The Bidder further proposes to accept a full payment for the unit price work proposed herein the amounts computed under the provisions of the Bid documents as based on the following unit price amounts, it being expressly understood that the unit prices are independent of the exact quantities stated in these documents. Estimated quantities are provided in the Invitation to Bidders and in the Instruction to Bidders. Payment will be made for actual quantities using Bidder's unit prices. The Bidder agrees that unit prices represent a true measure of the total labour and materials required to perform the work, including all allowances for overhead and profit for each type of unit of Work called for in the Bid documents, regardless of quantity.

	Item	Estimated Quantity	Unit Price	Extended Cost
1.	Treatment of Soil to below CCME Commercial/ Industrial criteria	902 tonnes	121.29	109,407.50
2.	Removal, transport and disposal of treated soil at landfill	902 tonnes	5.00	4,510.00
3.	Addition and Treatment of Water in the Remediation Process (with soil)	30,000 litres	0.14	7,000.-
4.	Treatment and/or Disposal of Water outside of soil treatment process to meet CCME Freshwater/ Aquatic Life Criteria	12,000 litres	0.20	2.400.-

EXTENDED UNIT PRICE COST	123,317.50
LUMP SUM COST	7,000.00
GST (7%)	9,262.23
TOTAL EXTENDED COST	141,579.23

Amount Written: One hundred; forty-one thousand, five hundred; seventy-nine dollars, twenty-three cents.

Note: Estimated quantities of water in Items 3 and 4 should be completed by the Bidder, however must total 62,000 litres.

Centra Gas has also requested that unit price costs be provided for treating only half of the total soil quantity (i.e. 451 tonnes) and water (31,000 litres). SUBJECT TO DISCUSSION

	Item	Estimated Quantity	Unit Price	Extended Cost
1.	Treatment of Soil to below CCME Commercial/ Industrial criteria	451 tonnes	____	____
2.	Removal, transport and disposal of treated soil at landfill	451 tonnes	____	____
3.	Addition and Treatment of Water in the Remediation Process (with soil)	____ litres	____	____
4.	Treatment and/or Disposal of Water outside of soil treatment process to meet CCME Freshwater/ Aquatic Life Criteria	____ litres	____	____

EXTENDED UNIT PRICE COST _____

LUMP SUM COST _____

GST (7%) _____

TOTAL EXTENDED COST _____

Amount Written _____

Note: Estimated quantities if water in Items 3 and 4 should be completed by the Bidder, however must total 31,000 litres.