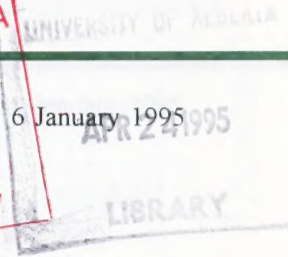
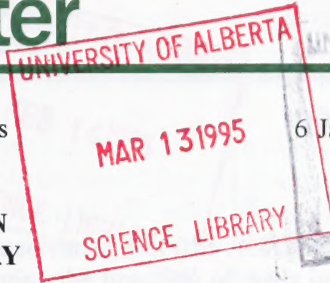


TO: All Oil, Gas, Pipeline and Oil Sands Operators

GOVERNMENT OF ALBERTA SUPPORT PLAN FOR THE UPSTREAM PETROLEUM INDUSTRY



6 January 1995

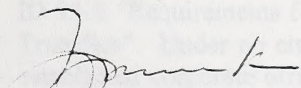
The Energy Resources Conservation Board and Alberta Public Safety Services (ERCB and APSS), together with the Canadian Association of Petroleum Producers (CAPP), developed this plan to support the upstream petroleum industry and local authorities to protect public safety and minimize hazards associated with any significant incident. This government support plan is designed to be compatible with existing industry and municipal emergency plans and direct the Provincial Government's response to an upstream petroleum industry incident anywhere in Alberta. The four prior editions of this plan address sour gas release incidents only while this fifth edition expands the plan's scope to include all incidents that occur in the upstream petroleum industry.

While the ERCB and APSS recognize that the industrial operator and local authority are the major players ensuring public safety during an upstream petroleum incident, we also recognize that the Government of Alberta has associated responsibilities and can play a significant role in the support of the industrial operator and local authority in bringing the incident under control as safely and quickly as possible.

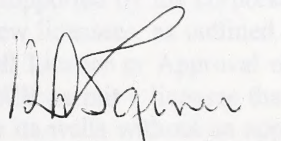
The upstream petroleum industry is encouraged to be familiar with and understand the workings of this plan and ensure that their plans reflect the purpose, authority, and scope of this plan. Any inquiries or concerns regarding this plan are welcome at either of the following:

Energy Resources Conservation Board
Environment Protection Department
640 - 5 Avenue S.W.
Calgary, AB T2P 3G4
(403) 297-3642

Alberta Public Safety Services
Emergency Response Planning
10320 - 146 Street
Edmonton, AB T5N 3A2
(403) 427-2772



F. J. Mink, P.Eng.
Vice Chairman



I. D. M. Egner, P.Eng.
Managing Director

Enclosure

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Energy Resources
Conservation Board

640 Fifth Avenue SW
Calgary, Alberta
Canada T2P 3G4

Informational Letter

IL 95-02

TO: All Oil, Gas, and Oil Sands Operators

11 January 1995

AGENT APPOINTMENTS

Recent revisions to Section 83 of the Oil and Gas Conservation Act (the Act/OGC Act) specified increased responsibilities for agents representing the licensees of wells in the Province of Alberta. These changes stemmed from a concern regarding agent accountability and responsibility in representing licensees, particularly those licensees which reside outside Alberta. Under the new legislation, where the Board has approved the appointment of an agent and when the licensee fails or is unable to comply with a duty or responsibility, the agent is responsible to comply with the duty or responsibility.

The new legislation requires a licensee to apply to the Board for approval of the appointment of an agent. An agent for a non-resident licensee is the principal contact for that licensee with respect to all matters pertaining to the operation of the licensee's wells and therefore the Energy Resources Conservation Board (ERCB) expects an agent to meet the same duties and responsibilities as the licensee. In order to be approved as an agent, the applicant must pass the same tests and have the same qualifications as the licensee. If the ERCB's requirements are not met, then the application for approval of the appointment of an agent will not be approved. As it is paramount that the care and custody of wells be in the hands of a responsible party at all times, the Board will not consider an agent to be discharged of its responsibilities until a new agent has been approved by the Board or the licensee becomes a resident in Alberta.

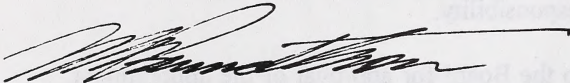
The ERCB wishes to make it very clear that the "appointment of an agent" carries increased responsibilities with respect to the chain of liability. For example, an agent will be responsible for a defunct licensee's share of abandonment costs for the wells included under the appointment.

The attached ERCB form entitled "Registration of Agent", accompanied with a fee of \$100, shall be submitted to the ERCB by any licensee utilizing the services of an agent to meet the requirements of Section 83(1) of the OGC Act. Where an agent has not been previously approved by the Board, the application must be supported by the corporate information (respecting the agent) which is required by all new licensees, as outlined in Interim Directive ID 93-2 "Requirements for the Issuance of a Well Licence or Approval of Well Licence Transfers". Under no circumstances will the ERCB permit a licensee that does not have an established corporate office in Alberta to operate its wells without an approved agent within

Alberta. Failure to maintain either an office or an approved agent will result in the suspension of the well licences on any terms and conditions prescribed by the Board until such time as an agent appointment has been approved by the Board or the licensee can satisfy the Board that it can otherwise discharge its responsibilities under the Act.

The requirement to apply to the Board for approval of the appointment of an agent is effective immediately for all new or first time non-resident licensees, and for all resident licensees intending to utilize the services of an agent. All licensees currently utilizing the services of an agent must apply for formal approval of the appointment of that agent within 6 months from the date of this Informational Letter.

Questions pertaining to this Informational Letter should be addressed to Ken Hunt of the Board's Drilling and Production Department at 297-6486.



N.G. Berndtsson, P.Eng.
Board Member



Energy Resources
Conservation Board
640 Fifth Avenue SW
Calgary, Alta T2P 3G4

Registration of Agent

Section 83, Oil and Gas Conservation Act

PART A: APPOINTMENT

The licensee _____ hereby appoints

_____ as its Registered Corporate Agent in the province of Alberta to carry out its duties and responsibilities under the Oil and Gas Conservation Act and Regulations and acknowledges this appointment does not relieve it of any duty or responsibility under the Oil and Gas Conservation Act and Regulations.

Date Signature Title

PART B: ACCEPTANCE

_____ hereby accepts this appointment and acknowledges it is responsible to comply with the duties and responsibilities of the licensee under the Oil and Gas Conservation Act and Regulations should the licensee not comply.

Date Signature Title

APPROVED on _____
Energy Resources Conservation Board

PART C: DISCHARGE

The licensee _____ hereby discharges

_____ as its Registered Corporate Agent in the province of Alberta under the Oil and Gas Conservation Act.

Date Signature Title

CONSENTED TO on _____
Energy Resources Conservation Board



PART A - APPOINTMENT
This is the form to be used by an insurance company to appoint an agent to sell its policies in a particular territory. It must be filled out by the company and signed by the agent. It must be filed with the ERCB within 30 days of the date of appointment.

At the time of appointment, the agent must be a resident of the province or territory in which he or she is to sell policies. The agent must also be a Canadian citizen or a permanent resident of Canada. The agent must be at least 18 years of age at the time of appointment.

This form must be filed with the ERCB within 30 days of the date of appointment. It must be filed in the office of the ERCB in the province or territory in which the agent is to sell policies.

PART B - ACKNOWLEDGEMENT
This form must be filled out by the agent to acknowledge the appointment. It must be signed by the agent and filed with the ERCB within 30 days of the date of appointment.

The agent must also provide the ERCB with a copy of his or her curriculum vitae. The curriculum vitae must be signed by the agent and filed with the ERCB within 30 days of the date of appointment.

NAME OF COMPANY
ADDRESS
CITY
PROVINCE/TERRITORY
POSTAL CODE

PART C - DECLARATION
I, the undersigned, do hereby declare that I am a resident of the province or territory in which I am appointed to sell policies and that I am a Canadian citizen or a permanent resident of Canada.

NAME OF AGENT
ADDRESS
CITY
PROVINCE/TERRITORY
POSTAL CODE

COMPLETED BY
NAME
ADDRESS
CITY
PROVINCE/TERRITORY
POSTAL CODE

SC

TO: All Oil, Gas, and Oil Sands Operators

ABANDONMENT COSTS ORDER APPLICATION REIMBURSEMENT APPLICATION

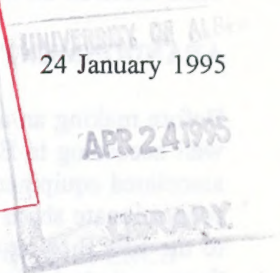
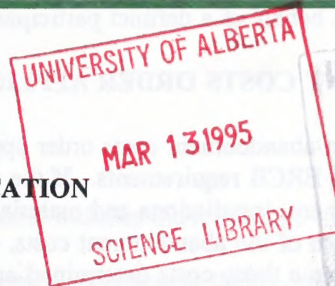
ABANDONMENT FUND

The Energy Resources Conservation Board (ERCB) is accepting applications for abandonment costs orders against reluctant working interest participants* and/or claims to the Abandonment Fund for reimbursement of wellbore abandonment costs incurred on behalf of defunct licensees and/or working interest participants. Applications shall be made on the prescribed form obtainable from the ERCB. A copy of the form and an application process flow chart are attached. The application fee for abandonment costs orders is \$100.00. There is no fee for reimbursement applications. This informational letter briefly discusses the criteria for applying. The ERCB will process the applications and upon completion, issue the abandonment costs order and/or authorize reimbursement for reasonable costs expended. Approval will be subject to any conditions, restrictions or stipulations that the ERCB may prescribe. The ERCB may refuse to issue the abandonment costs order and/or reimbursement if the criteria are not met.

BACKGROUND

The timely abandonment of wells, particularly orphan wells, is a concern shared jointly by the oil and gas industry associations and the ERCB. The ERCB announced in Interim Directive ID 93-2, the establishment of an industry supported Abandonment Fund (the Fund). The Fund was established to pay for a defunct participant's share of the cost to abandon a well. The Fund is currently restricted to the payment of wellbore abandonment and site clean-up costs directly associated with the wellbore abandonment. Facility removal, associated gathering system pipeline abandonment and surface reclamation costs are not included. The Fund is maintained through an annual levy on inactive wells and a first time well licensee fee. The ERCB administers the Fund.

The Oil and Gas Conservation Act provides the legislative framework for the Fund and the issuance of abandonment costs orders. A well must be abandoned when required by the Oil and Gas Conservation Regulations or when directed by the ERCB. Where a reluctant participant refuses to pay its proportionate share of the abandonment costs, the participant



who incurred the costs may make application for the payment of the costs to be ordered by the ERCB. The ERCB can order the reluctant participant's share of the abandonment costs, plus a 25 per cent penalty, payable to the participant that incurred the debt. The legislation also provides for a participant to apply for reimbursement from the Fund for abandonment costs incurred on behalf of a defunct participant.

ABANDONMENT COSTS ORDER APPLICATION

Before making an abandonment costs order application, a participant must first abandon the well according to ERCB requirements. If the reluctant participant's share of the sale of any associated equipment, installations and materials do not generate sufficient funds to cover its proportionate share of the abandonment costs, the participant that incurred the debt may apply to the ERCB to have those costs determined and an abandonment costs order for payment of those costs to be issued. The applicant must show it has taken all reasonable steps to recover costs, including remedies available to it under any agreements between the participants.

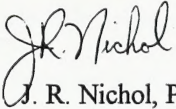
The ERCB will send notice to the reluctant participant requiring payment to be made within 30 days. Upon expiry of the notice period and an unsatisfactory response, the abandonment costs order, effective immediately, will be issued including the penalty. A certified copy of the abandonment costs order provided by the ERCB may then be filed by the applicant in the office of the clerk of the Court of Queen's Bench. Upon filing, and payment of any fees prescribed by law, the abandonment costs order will be entered as a judgement of the Court and may be enforced according to the ordinary procedures for enforcement of a judgement of the Court.

REIMBURSEMENT APPLICATION

If a participant in a well is defunct, its share of the abandonment costs may be reimbursed from the Fund upon application by the participant who incurred the costs. The applicant must first have exhausted all reasonable steps necessary to collect the funds. This includes pursuing the enforcement of any abandonment costs order that has been issued. In cases where a participant has been struck from the corporate registry and there is no responsible party left, it may be possible to apply directly for reimbursement without first applying for an abandonment costs order.

If a participant who received money from the Fund subsequently recovers money from the defunct participant, it must reimburse the Fund to the extent of the money recovered. Where payment has been made from the Fund, the ERCB can pursue all remedies provided under the Oil and Gas Conservation Act for reimbursement to the Fund.

Questions regarding this informational letter and the application criteria or handling procedures should be directed to the Drilling and Production Department at 297-2529 or 297-3265.



J. R. Nichol, P. Eng.
Manager
Drilling and Production Department

Attachments:

* The word *participant* used in this informational letter includes the following:

1. *licensee*, means a holder of a well licence according to the records of the ERCB and includes a receiver-manager of property of the licensee,
2. *agent*, means a duly appointed agent of a licensee pursuant to section 83 of the Oil and Gas Conservation Act, and
3. *working interest participant*, means a person who owns or controls all or part of a beneficial or legal undivided interest in a well under agreements that pertain to the ownership of that well and includes a person who has actual control of the corporation, including a person referred to in section 2(2) of the Business Corporations Act.

Questions regarding this information letter and the application process should be directed to the Drilling and Production Department at 281-2337 or 281-2342.

The amount of the award is determined by the amount of the participant's contribution to the cost of the well. The amount of the award is based on the amount of the participant's contribution to the cost of the well. The amount of the award is based on the amount of the participant's contribution to the cost of the well.

[Signature]
 E. Robert P. Eng
 Manager

Drilling and Production Department

Participants and their families are encouraged to contribute to the cost of the well. The amount of the award is based on the amount of the participant's contribution to the cost of the well. The amount of the award is based on the amount of the participant's contribution to the cost of the well.

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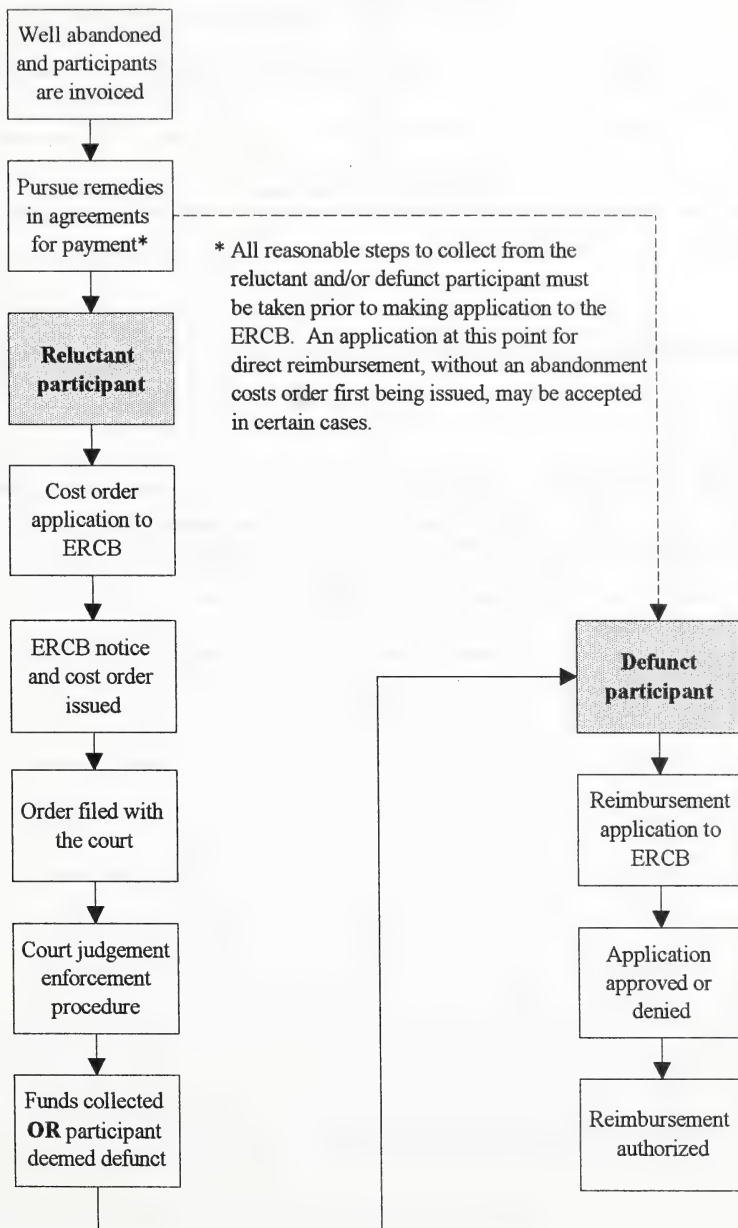
The amount of the award is based on the amount of the participant's contribution to the cost of the well. The amount of the award is based on the amount of the participant's contribution to the cost of the well. The amount of the award is based on the amount of the participant's contribution to the cost of the well.

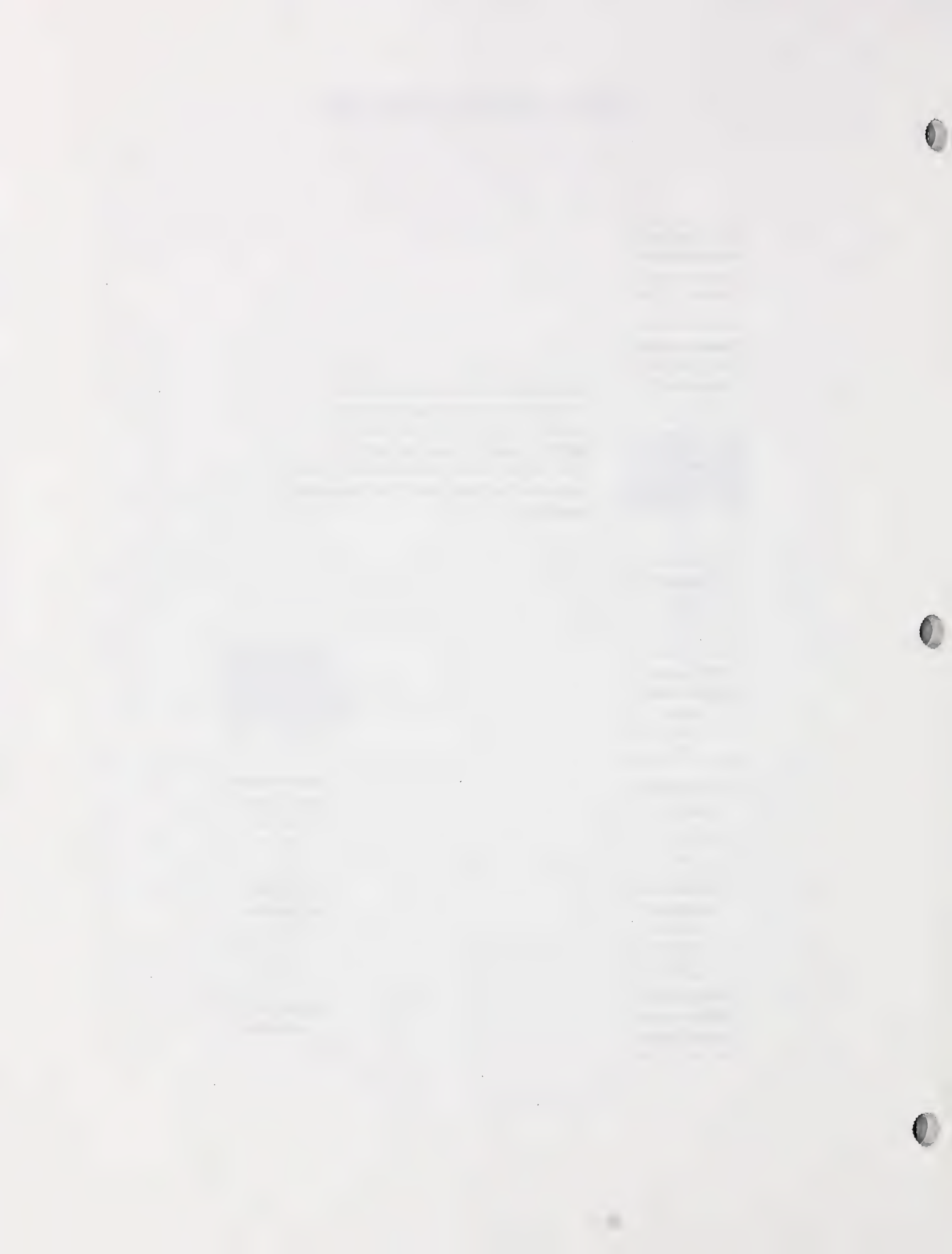
REIMBURSEMENT APPLICATION

If a participant is a self-insured, the share of the abandonment costs may be reimbursed from the Fund upon application by the participant who incurred the costs. The applicant must file their application for reimbursement as soon as possible to collect the funds. This includes providing the applicant with a copy of the abandonment order that has been issued. In cases where a participant has been struck from the company registry and there is no responsible party left, it may be possible to apply directly for reimbursement without first applying for an abandonment cost award.

If a participant who received money from the Fund subsequently recovers money from the defunct participant, it must reimburse the Fund to the extent of the money recovered. Where payment has been made from the Fund, the ERCB can pursue all remedies provided under the Oil and Gas Conservation Act for reimbursement to the Fund.

APPLICATION PROCESS FLOW CHART







Energy Resources
Conservation Board
640 Fifth Avenue SW
Calgary, AB T2P 3G4

- Abandonment Costs Order Application (\$100 Fee)
 Reimbursement Application (No Charge)

| Section A - Applicant Information | Section B - Reluctant Working Interest Information |
|---|---|
| Company Name _____ Address _____ _____ Phone _____ FAX _____ Contact Person _____ | (If more space is required please attach list) Company Name _____ Address _____ _____ Phone _____ FAX _____ Contact Person _____ |

Section C - Well Details

Unique Well Identifier _____ Well Licence Number _____

Section D - Well Abandonment Cost Detail

| Working Interest Participant Name <small>(If more participants are involved than space available, please attach list.)</small> | Interest Held (%) | Cost Share (\$) | Requesting Cost Order Against Reluctant Working Interest (√) Check Box | Requesting Reimbursement for a Defunct Working Interest (√) Check Box |
|---|----------------------|--------------------|--|---|
| 1. | % | \$ | | |
| 2. | % | \$ | | |
| 3. | % | \$ | | |
| 4. | % | \$ | | |
| 5. | % | \$ | | |
| 6. | % | \$ | | |
| 7. | % | \$ | | |
| 8. | % | \$ | | |
| 9. | % | \$ | | |
| 10. | % | \$ | | |
| 100 % | | Total \$ | | |

Board Use Only

Company Code #2 Amount Authorized for Reimbursement \$ _____

Cost Centre C5010 ERCB Cheque No. _____

GL Account 560200

Trust Deposit Yes No Approved By _____ Date _____

Section E - Summary of Cost Recovery Attempts

Section F - Applicant Certification

The Applicant certifies:

The well is abandoned in accordance with ERCB requirements. Reimbursement is for wellbore abandonment costs only. All reasonable steps have been taken to collect from the reluctant and/or defunct working interest participant, including the specific actions outlined in Section E. Money received from the abandonment fund will be reimbursed to the extent of any money subsequently recovered from the defunct working interest participant. The ERCB shall have the right to audit the records of the applicant or its administrators, successors, or assigns for a period of 6 years following receipt of the funds and the applicant agrees to maintain its records for that period of time.

Signature

Title

Date

FORM COMPLETION INSTRUCTIONS

APPLICATION TYPE

Check the appropriate box to identify which type of application is being made. One or both types of applications may be made on the same form.

SECTION A Identify the company name, address, phone number, fax number and contact person of the party making the application.

SECTION B COMPLETE THIS SECTION FOR COST ORDER APPLICATIONS ONLY. Identify the company name, address, phone number, fax number and contact person of the reluctant working interest participant to whom the cost order is to be issued.

SECTION C Identify the full unique well identifier and well licence number of the well for which the application is being made.

SECTION D Identify the full corporate company name, trade name or individual name of each working interest participant in the well. Identify the percentage interest held by each party. Identify the total wellbore abandonment cost and each party's proportionate share.

Place a (✓) in the appropriate column and box to identify, for which party and application type, the request is being made. More than one party may be identified for each application type. If applying for reimbursement where a cost order has been previously issued, enter the cost order number in the cost order column.

SECTION E REIMBURSEMENTS ARE MADE FOR DEFUNCT PARTIES ONLY. ALL REASONABLE STEPS NECESSARY TO COLLECT THE FUNDS MUST BE MADE PRIOR TO APPLYING FOR A COST ORDER AND/OR REIMBURSEMENT FROM THE ABANDONMENT FUND.

Provide a summary of the steps taken to collect from the reluctant and/or defunct working interest participant and the reasons why collection is not possible.

SECTION F The applicant must date and sign the form certifying that the application is made in accordance with the terms set out in this section.

**Informational
Letter**

IL 95-04

TO: All Oil and Oil Sands Operators

22 March 1995

CRITERIA FOR THE APPLICATION OF OILY BYPRODUCTS TO ROADS**1.0 BACKGROUND**

This informational letter supersedes General Bulletin GB 92-10 and outlines the criteria that oily byproduct materials¹ must meet to be applied to road surfaces. It also addresses the environmental considerations surrounding the safe and responsible application of the material, including an oily byproduct sampling protocol, analytical methodologies, reporting procedures, and recommended practices for the application of oily byproduct material to road surfaces. The byproduct material, which is typical of that recovered or generated primarily during insitu oil sands and heavy oil production operations in northeast Alberta, is a resource valued by local communities when applied to permanent roads in accordance with the criteria set out in this informational letter. A joint industry, government, and scientific task force has been investigating and researching this matter for many years. Their research has shown that, if applied appropriately, this material poses minimal environmental impact and safety risks.

The Alberta Energy and Utilities Board (AEUB) considers the application of oily byproduct material to public or private roads as one of a number of acceptable management options available to industry. This policy has been developed in consultation with the public, through interest groups and surface rights associations, along with key municipalities. The criteria used in this policy are consistent with the agricultural requirements derived by the Canadian Council of Ministers of the Environment (CCME) in the *Interim CCME Environmental Quality Criteria For Contaminated Sites*.

It remains the AEUB position that operators must continue to maximize the recovery and conservation of resources and to minimize the amount of byproduct material generated. Operators producing this material are strongly encouraged to review their respective handling and disposal techniques in consideration of alternate oil reclamation programs. Good operating practices used in the management of storage facilities for oily byproducts such as minimizing the volumes of produced water and other oilfield wastes entering these facilities and the removal of free water will greatly assist in meeting the criteria set out in this informational letter.

¹ Byproduct material containing oil or bitumen generated primarily during, but not restricted to, heavy oil production such as sands, slop oil, and oil containing small volumes of snow, earth, or other debris collected as a result of site clean-up activities.

2.0 CHARACTERIZATION

Oily byproduct material may be applied to road surfaces if the following characterization criteria can be met:

- 2.1 No free water. Every effort should be made to ensure water on the surface or lying within the storage facilities is recovered prior to removing the oily byproduct material for application to roads.
- 2.2 Oil shall be of a density greater than 920 kg/m³. Material with less than 5 per cent residual hydrocarbon is unacceptable as road mix.
- 2.3 pH ≥ 6.
- 2.4 Total salts (calculated as a loading limit):
 - Na ≤ 5 500 kg/ha,
 - Cl ≤ 7 000 kg/ha.
- 2.5 Total metals (concentration in sample):
 - Cd ≤ 3 mg/kg
 - Hg ≤ 0.8 mg/kg
 - Pb ≤ 375 mg/kg
 - Ni ≤ 150 mg/kg
 - Cu ≤ 150 mg/kg
 - Zn ≤ 600 mg/kg
- 2.6 The material must not contain halogenated hydrocarbons, hazardous chemicals, refined or lube oils, flare pit sludges, or deleterious substances such as filters, rags, vegetation, or other debris including significant volumes of contaminated agricultural soils.

3.0 APPLICATION DEPTH

The maximum depth of application of material is limited to the smallest of the "Calculated Application Depths" determined for Na and Cl using the following formula:

$$d \text{ (cm)} = \frac{L \times 10^4}{D \times C}$$

- where:
- d = depth (cm) - calculated.
 - L = loading rate (kg/ha) - specified in section 2.4 for Na and Cl.
 - D = density of sample (kg/m³) - determined by laboratory.
 - C = concentration Na and/or Cl (mg/kg) - determined by laboratory.

Note: Application method for oily byproduct materials are set out in the Sask/Alta Waste Disposal Co-operative report, "*Alberta Recommended Practices for Road Surfacing and Dust Suppression Techniques*"² (revised July 1994). The amount of material that can be applied to roads, as calculated above, must also be consistent with that report. Industry is encouraged to adopt these as minimum acceptable oily byproduct application methods.

4.0 SAMPLING AND ANALYSIS

Proper oily byproduct characterization is highly dependent on the requirement to take a representative sample. Appendix I outlines, in detail, a sampling protocol which when followed will yield an acceptable sample for characterization of oily byproduct material.

An updated analytical methodology and a standardized reporting format have also been developed (Appendix II) to ensure consistency in chemical analysis procedures and units of measurement. The use of these are encouraged, however, equivalent methods may be acceptable.

5.0 MIXING OF BYPRODUCT MATERIALS

If the material to be used for road surfacing or dust suppression is a combination of two or more oily byproduct streams (eg. from a number of different storage facilities), each must be sampled and analysed in accordance with the methods prescribed. The limiting factor for application of the aggregate material will be dependant on loading limits of Na and Cl noted in section 3.0 assuming metals are within the established limits. Therefore, the limiting application depth of the oily byproduct materials used in the final mix will be calculated as follows:

$$d \text{ (cm)} = \frac{L \times 10^4}{(D1 \times C1 \times P1) + (D2 \times C2 \times P2)}$$

- where: d = maximum application depth (cm) - calculated.
- L = loading rate (kg/ha) - specified in section 2.4 for Na and Cl.
- D1 = density of first substance (kg/m³) - determined by laboratory.
- C1 = concentration Na or Cl (mg/kg) - in first substance determined by laboratory.
- P1 = proportion of first substance in the final mixture.
- D2 = density of second substance (kg/m³) - determined by laboratory.
- C2 = concentration Na or Cl (mg/kg) - in second substance determined by laboratory.
- P2 = proportion of second substance in the final mixture.

EXAMPLE CALCULATION

From data sheet:

| Notes | Sample # | Density (kg/m ³) | Concentration (mg/kg) | Calculated depth of application |
|----------|----------|------------------------------|-----------------------|---------------------------------|
| Sand | 1 | 1792 | Na = 3300 | 9.30 cm |
| | 1 | | Cl = 5640 | 5.97 cm |
| Slop Oil | 2 | 1052 | Na = 3350 | 15.6 cm |
| | 2 | | Cl = 6900 | 9.64 cm |

Assume the mix will contain 70% sand and 30% slop oil by volume.

In this example, Cl is the limiting factor in both samples (5.97 cm in #1 and 9.64 cm in #2). If Na was the limiting factor in one sample and Cl in the other, the mixing depth calculation would have to be repeated for both Na and Cl. The smaller of the two calculated application depths would be the limiting factor for the composite mix.

Using the equation above :

$$d \text{ (cm)} = 7000 \text{ kg/ha} \times 10^4 / \{ (1792 \text{ kg/m}^3 \times 5640 \text{ mg/kg} \times 0.70) + (1052 \text{ kg/m}^3 \times 6900 \text{ mg/kg} \times 0.30) \} = 7.56 \text{ cm}$$

The mix of 70 per cent sand and 30 per cent slop oil can be applied 7.6 cm deep.

6.0 APPROVAL PROCESS


An application to use oily byproduct material as part of a road surfacing or dust suppression project must be received by the appropriate AEUB Area Office. All applications must be supported with a completed copy of the Oily Product Characterization for Road Disposal Data Sheet (Figure 3 in Appendix II) signed by a laboratory representative and the operator who confirms that the information is accurate and in accordance with the requirements set out in this information letter. Also required is a letter of consent from the recipient (local authority or landowner), a map indicating the location and length of road where the oily byproduct material will be applied, and the estimated volume of oily byproduct and its source.

Where the oily byproduct material does not conform with the established criteria within this document, the AEUB will entertain site-specific applications for alternative use or disposal of the material.

NOTE: Use of oily byproduct material in agricultural product storage areas, feed lots, or temporary lease roads will not be approved.

Research into this practice by the task force will continue. New information brought forward will be reflected in future revisions to this policy. It is anticipated that this policy will eventually be incorporated in the AEUB *Oilfield Waste Management Requirements* document expected to be published soon. In particular the AEUB will look to further simplify or eliminate the application process within the next two years.

Operators wishing more information on this matter should contact the appropriate AEUB area office or the AEUB Environment Protection Department in Calgary at 297-3642.



B. F. Bietz, Ph.D., P.Biol.
Board Member

Attachments

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APPENDIX I

OILY BYPRODUCT SAMPLING PROTOCOL

1 SAFETY

Individual company site-specific safety requirements for sampling personnel must be followed.

2 SAMPLE COLLECTION

2.1 Core Sampling Method

A representative sample must be obtained from each storage facility or container whose contents are to be used in the disposal project in question. The preferred method is to collect a composite sample made up of subsamples collected from a grid pattern spaced evenly across the storage facility (Figure 1). The full depth of the material is to be sampled (Figure 2). For large storage facilities where grid sampling is impractical, subsamples should be collected from points of access around the perimeter to obtain as representative a sample as possible.

Subsamples should be collected at least one metre from the edge of the storage facility wall. As a rough guide to sampling intensity for facilities less than 500 square metres in area, a minimum of five subsamples should be taken. For storage facilities greater than 500 square meters in area, a minimum of nine subsamples should be taken. The subsamples should be composited into 1 representative sample for analysis.

Subsamples should be collected using Shelby Tubes or hollow metal or PVC tubes 50-75 mm in diameter and of sufficient length, or with sufficient extensions, to sample the full depth of the oily sand material.

Prior to sampling a storage facility, the core sampler should be thoroughly cleaned using a three-stage process. The initial cleaning should be done with an oil solvent, such as varsol and a wire brush and clean rag pull-through. The second stage should be done by rinsing with acetone or hexanol, until a clean cloth can be pulled through. Finally, a distilled water rinse should be used to remove any residue from the sampler.

2.2 Backhoe Method

An alternate method for taking the samples during or immediately prior to cleaning out the storage facility is to collect representative samples using a backhoe. Subsamples should be collected using a grid pattern similar to that described for core sampling. The full depth of the oily byproduct material should be included in the subsample as much as possible.

It is not practical to wash the backhoe bucket in a similar fashion to that described for core sampling. Therefore, in order to ensure that the subsamples do not become contaminated by mixing with previously sampled materials, enough of the material contained in each bucket must be sliced away using a clean spade or trowel so that a subsample slice or representative grab sample can be taken away from the sides of the bucket. Prior to sampling the storage facility, the sampling tools must be cleaned using a three-stage wash procedure similar to the one described for core sampling.

3 SAMPLE HANDLING

The subsamples should be composited by placing them in a 20 litre high-density polyethylene pail. Any excess free liquid (oil and/or water) should be decanted at the site. The sample pail must be immediately labelled with a unique identification number and a sample identification sheet must be filled in. The pail must be properly labelled to comply with WHMIS requirements. If the sample is under 22 litres, no TDGA vehicle placarding is required, however, proper TDGA labelling is required.

The sample pail is to be kept cool with an optimum storage temperature of less than 4°C and shipped to the laboratory within 48 hours. Any samples which have not been kept cool for any period greater than 48 hours prior to analysis must be considered as invalid.

A copy of the sample sheet, including the Oily Byproduct Characterization for Road Disposal Data Sheet (Figure 3), must be sent with the sample to the laboratory.

It is the responsibility of the operator to clearly identify the nature of the sample, its intended use and the analytical protocol to be followed by the laboratory.

Due to the complexity and precision required in this analytical program, operators are requested to use a major laboratory qualified to analyze oily byproduct material samples specific to the needs of oily byproduct characterization.

Top and Side Views of a Typical Storage Facility

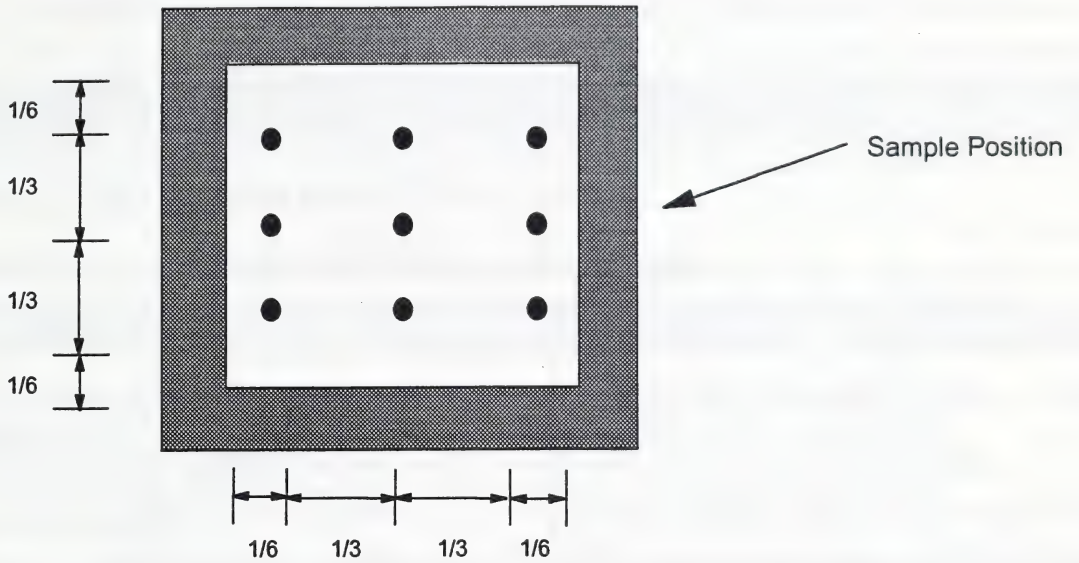


Figure 1: Example of Oily Byproduct Storage Facility Sampling Positions (for containers less than 500 m² of surface area)

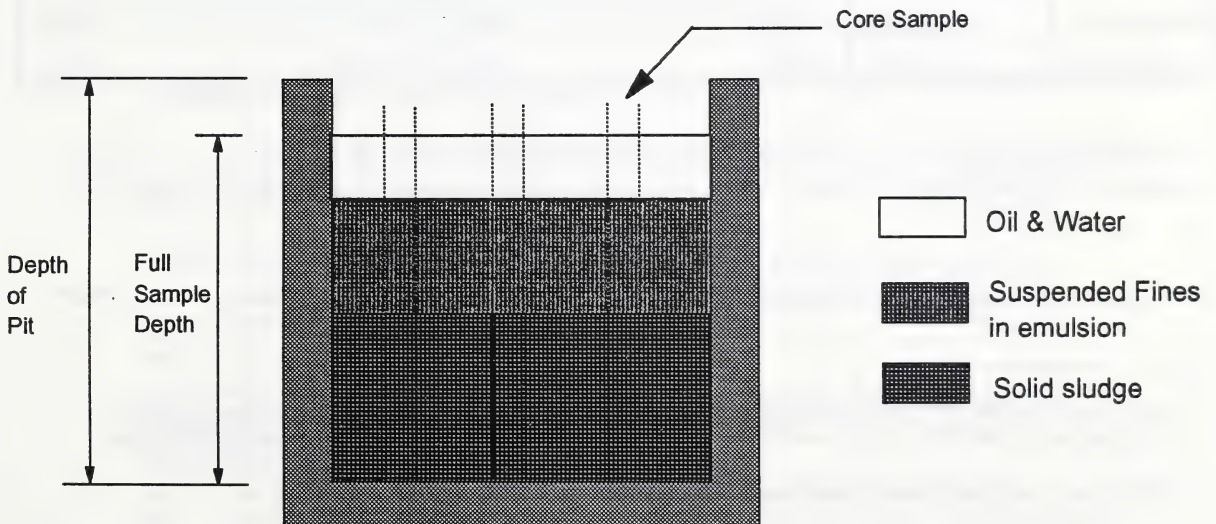


Figure 2: Cross Section of a Typical Storage Facility

FIGURE 3 OILY BYPRODUCT CHARACTERIZATION FOR ROAD DISPOSAL DATA SHEET

Laboratory Name: _____

Lab Sample Number: _____ Date Received: _____

Field Sample Number: _____ Date Analysed: _____

Sample Information

| | |
|--|---|
| Company: | Source: (eg ecology pit, desand tank etc.) |
| Location: Lsd — — — W M | Description: (eg oily sand, slop oil etc.) |

| Composition | (Dean Starks) | Extractable Salts | | (1:9 Dilution) |
|-------------------|-------------------|-------------------|---------------|---|
| Oil | % | pH | | SC dS/M |
| Solids | % | | Concentration | Calculated Depth of Application ² |
| H ₂ O | % | Na | mg/L | mg/Kg cm |
| Density of Sample | kg/m ³ | Cl | mg/L | mg/Kg cm |

Total Metals (US EPA 3050 (SW 846))

| | Concentration | | Concentration | | Concentration |
|------------|---------------|-----------|---------------|-----------|---------------|
| Cadmium/Cd | mg/Kg | Nickel/Ni | mg/Kg | Lead/Pb | mg/Kg |
| Mercury/Hg | mg/Kg | Zinc/Zn | mg/Kg | Copper/Cu | mg/Kg |

Maximum application depth _____ cm (least "Calculated Depth of Application" from above).

The undersigned hereby certifies that the information is accurate and in accordance with the requirements of Information Letter IL 95-4.

Signed: _____ (Laboratory) _____ (Operator)

¹Sample must not contain halogenated hydrocarbons, hazardous chemicals, refined or lube oils flare pit sludges or deleterious substances such as filters, rags, vegetation and other debris including significant volumes of contaminated agricultural soils.

²The calculated depth of application for each constituent is determined as follows:

$$d \text{ (cm)} = \frac{L \times 10^4}{D \times C}$$

where: d = depth (cm) - calculated
 L = loading rate (kg/ha) - specified in section 2.4 for Na and Cl
 D = density of sample (kg/m³) - determined by laboratory
 C = concentration (mg/kg) determined by laboratory

This represents the calculated maximum depth of oily sludge (prior to mixing with aggregate) allowed, without exceeding each parameter limit specified in section 2 of the information letter. Your maximum allowed application depth is the smallest of the two calculated values and total metals concentration must not exceed these values specified in section 2.5. You must also follow the Recommended Standards of Practice.

APPENDIX II

ANALYTICAL PROTOCOL FOR THE CHARACTERIZATION OF OILY BYPRODUCT MATERIAL FOR APPLICATION TO ROADS

SUMMARY

The following protocols are to be used in the characterization of oily byproducts to assess their suitability for incorporation into road construction or application.

RECEIPT OF SAMPLES AT ANALYTICAL LABORATORIES

1 Safety

All personnel responsible for receiving and handling samples for oily byproduct analysis should exercise caution when opening the oily byproduct sample containers or when preparing bulk samples for analysis. Oily byproduct material may contain some quantities of hydrogen sulphide, condensates or other volatile hydrocarbons. Standard laboratory safety practises should be followed at all times.

2 Sample Storage

Samples for characterization are usually collected and submitted in containers of various sizes up to 20 litres in volume. Samples should be stored in a refrigerator at 4°C immediately upon arrival and following each and every sample preparation and analytical step.

3 Subsampling and Sample Preparation

Prepare those samples which have been properly collected, stored and which have been stored 30 days or less from the date of collection, as follows:

- visually examine sample, record approximate volumes of free water and solids;
- decant carefully and discard any free water in the sample container, taking necessary precautions to avoid loss of hydrocarbons;
- remove all large rocks, twigs, or vegetation; and
- on the remaining oily byproduct material, obtain a homogenous aliquot using an appropriate method suitable for the type of material received. One or more of the following methods may be used:
 - (a) mix by shaking the contents in the sample container (if sufficiently fluid),
 - (b) mix by manual stirring in the sample container or in a large non-contaminating tray using a plastic or teflon coated rod, or
 - (c) mix by mechanically stirring using a teflon coated probe or paddle.

Large clusters of material remaining after following one of the above procedures should be broken down by hand and incorporated into the sample prior to subsampling.

From the homogenate, collect a 2 kg representative aliquot into a clean glass jar with a teflon lined lid. Store sample at 4°C. Use this sample to conduct all analyses.

If the sample characteristics are such that the above mixing and sub sampling procedures are inadequate or inappropriate, contact the Alberta Energy and Utilities Board (AEUB) at (403) 297-3642 for assistance.

4 Analytical Requirements

The following analyses are required for the characterization of the oily byproduct material:

| Method | Parameters |
|--|---|
| * 1:9 (sample:water) Water Soluble Extract | pH, Specific Conductance, Chloride, Sodium. |
| * Composition Analysis (Dean Stark) | % water, %solids,%hydrocarbon. |
| * Total Metals (US EPA 3050 (SW 846)) | Cadmium, Mercury, Lead, Nickel, Copper, Zinc. |
| Specific Gravity (Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF. 16th Ed. Washington. 1985. Method 213 E.) | Density of Oily Byproducts resembling sludges. |
| Specific Gravity (American Society for Testing and Materials, Washington. 'Standard Method for Specific Gravity of Soils', Designation D 854 - 83) | Density of granular oily byproducts such as oily sands and silts. |

*Unique analytical methods are included in the appendix of this document. The remaining methods can be found in the cited sources. The use of alternate equivalent methods may be acceptable and should be discussed with the AEUB prior to their use.

Use the standard report form as supplied (see attached "Oily Byproduct Characterization for Road Disposal Data Sheet") to report all data.

5 Quality Control / Quality Assurance

An ongoing quality control program must be carried out by each participating laboratory. Such activities may be monitored by the AEUB in conjunction with the oily byproduct generators. It is expected that each laboratory will monitor its own precision and accuracy as a part of its quality assurance by repeating analysis on the same sample within a run and within the scope of the method. This activity should be repeated over the period of the oily byproduct characterization and disposal program. The data should include results from the same as well as different analysts. Biases or skewness should be determined using statistical methods such as Youden's plots on appropriate samples.

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1:9 WATER SOLUBLE EXTRACT ANALYSIS OILY BYPRODUCT MATERIAL FOR APPLICATION TO ROADS (TENTATIVE)

1 SUMMARY

This method has been developed to assist laboratory and field staff in assessing the potential for environmental damage to soil, vegetation, ground and surface water, animal life, etc. from the application of oily byproducts, gas or oil plant sludges, crude oil or produced water spills, sump fluid disposal, or many other byproducts of the energy industry.

A water soluble extract analysis of the non-aqueous products provides a rapid measurement of readily available parameters (major ions, pH, Specific Conductance, toxicity) which could be of environmental concern. When carried out on soil, it will assist in determining agricultural productivity and/or applying proper methods for soil rehabilitation.

The sample is shaken with demineralized water at a 1:9 (sample:water) ratio for several hours and then allowed to stand overnight. Analyses are carried out on the clarified aqueous portion. Data are expressed as milligrams of constituent per kilogram of original material as received.

2 SCOPE AND APPLICATION

This method is applicable to any non-aqueous, water insoluble (or slightly soluble) material, such as oily sludges, tank bottoms, oil and produced water contaminated reservoir sand, slop oil, reclaimed crude oil, spill debris, etc.

The method as described specifically relates to water soluble extracts on oily byproduct material which are being considered for application to roads, and is intended for the determination of pH, Specific Conductance, chloride and sodium.

3 SAMPLE HANDLING AND PRESERVATION

- 3.1** Samples should be subsampled from the field containers (usually a 20 L polyethylene pail or bottle).
- 3.2** Visually examine sample, record ratio of free water to solids.
- 3.3** Decant and discard any free water in the sample container.
- 3.4** Remove all large rocks, twigs or vegetation.

3.5 On the remaining oily byproduct material, obtain a homogenous mixture using an appropriate method suitable for the type of material received. One of the following methods may be used:

3.5.1 Mix by shaking in the sample container.

3.5.2 Mix by manual stirring in the sample container or a large non-contaminating tray using a plastic or teflon-coated rod.

3.5.3 Mix by mechanically stirring using a teflon coated probe or paddle.

NOTE: large clusters of material remaining after following one of the above methods should be broken down by hand and incorporated into the sample.

3.6 Collect a 2 kg aliquot of the homogenized sample and place in a clean glass jar (1 L) with a teflon lined lid. Store sample at 4° C to minimize losses of volatile components and to reduce biodegradation.

3.7 Collect a subsample from the 1 L glass jar by first mixing the contents with a durable glass rod and then collecting the sample using a glass tube and rod subsampling device. At this stage, other subsamples should be collected for metal and composition analyses. Refer to the specific methods for further instructions.

4 APPARATUS AND MATERIALS

4.1 Electronic Balance, capacity approx. 5000 gms, capable of measuring to 0.1 gm accuracy, Mettler PE 6000 or equivalent.

4.2 Mechanical Shaker, Eberbach or equivalent.

4.3 pH Meter, such as Fisher Accumet Model 950 or equivalent.

4.4 Conductivity Meter, equivalent to Radiometer Model CDM 83.

4.5 Atomic Absorption Spectrophotometer, equivalent to Varian Model AA-475.

4.6 Ion Chromatograph, Waters Chromatography.

4.7 Demineralized water, conforming to as described in Type I, Standard Methods for the Examination of Water and Wastewater.

5 INTERFERENCES

5.1 The type of samples which can be extracted by this method are limited by the character

of the samples that will partition water soluble components from the organic phase to the aqueous phase and which will yield to homogenization and representative subsampling. No interferences are known for the samples described by this scope.

6.0 PROCEDURE

- 6.1 Prepare a 1:9 (sample:water) mixture by weighing 100 grams, ± 0.1 grams (to an accuracy of ± 0.1 g) of homogenized oily byproduct material into a 2 litre glass jar with a teflon lined lid. Add 900 mL demineralized water.
- 6.2 Shake on a mechanical shaker for 2 hours.
- 6.3 Allow to stand overnight at 4° C.
- 6.4 Decant supernate - if supernate portion of sample is extremely turbid with suspended solids, clarification may be carried out by filtering supernate through a coarse (5 μ m) pure cellulose filter paper. Carry out pH and Specific Conductivity measurements on the supernate. Follow instrument manufacturers recommended procedures.
- 6.5 Filter a portion of the supernate through 0.45 μ m cellulose acetate filter paper. Carry out chloride and sodium analyses on the supernate by Ion Chromatography and Atomic Absorption Spectrophotometry respectively, following manufacturers recommended procedures.

NOTE: other approved analytical methodology may be used, such as titrimetric or colorimetric procedures for chloride determinations, and flame emission or Inductively Coupled Plasma Emission for sodium determinations.

7 SAFETY AND HEALTH CONSIDERATIONS

Analysts or other laboratory personnel involved in oily byproduct analyses should exercise standard laboratory safety practices. Noxious fumes of hydrogen sulfide and light end hydrocarbons may be present in oily byproduct material.

Follow manufacturers instructions for the safe operation of analytical instruments.

8 QUALITY CONTROL

- 8.1 Duplicate analyses should be conducted every 20 samples, with a minimum of one duplicate per analytical run.
- 8.2 Quality control samples which contain known concentrations of the elements of interest should be run concurrently with routine samples on each analytical run. Quality control charts must be maintained to monitor performance.

- 8.3 Laboratories must have accepted quality assurance - quality control protocol in place, and should follow good laboratory operating practices.

9 DATA GENERATION AND CALCULATIONS

- 9.1 Report pH values in pH units and Specific Conductance in dS/m on the liquid supernate as prepared in section 6.4.
- 9.2 Report chloride and sodium values in mg/L obtained from the liquid supernate as prepared in section 6.5, and then calculate the concentration of these elements in mg/Kg appearing in the original sample "as received" ie. mg/L (from supernate) x 9 = mg/Kg.
- 9.3 Use the standard report form as supplied (see attached, "Oily Byproduct Characterization for Road Disposal Data Sheet") to report all data.
- 9.4 Calculate the loading value for sodium and chloride in Kg/ha by following the calculation as outlined on the data sheet. This provides a loading value in Kg of constituent per hectare of road surface.

10 PRECISION AND ACCURACY

Each laboratory involved in oily byproduct material analyses by this protocol must provide precision and accuracy data with each sample.

Sensitivity and detection limits required for this method are listed as follows:

| Parameter | Sensitivity | Detection Limit |
|----------------|-----------------|-----------------|
| pH | ± 0.05 pH units | N/A |
| Specific Cond. | 1% full scale | 1 μ S/cm |
| Sodium | ± 1 μ g | 0.1 mg/L |
| Chloride | ± 1 mg | 1 mg/L |

11 REFERENCES

- 11.1 "Water Soluble Extract Analyses (Tentative)", Energy Resources Conservation Board, Chemical Research Laboratory, Calgary, Alberta.
- 11.2 Personal communication, M. Korchinski, D. DeGagne, Energy Resources Conservation Board, Calgary, Alberta.
- 11.3 "Manual on Soil Sampling and Methods of Analysis", J.A. McKeague, Second edition, 1978.

DEAN STARK ANALYSIS FOR OILY BYPRODUCTS

1 SUMMARY

Dean Stark Analysis is used to determine the hydrocarbon, water, and solids contents of oily byproduct samples by using a toluene reflux to separate these components. Condensed solvent and water are continuously separated in a distillation trap, with the water being retained in the trap. The solvent is recycled through the extraction thimble of the extraction apparatus to dissolve the hydrocarbon. The solids remaining in the thimble after extraction are measured gravimetrically, the water content is measured by volume in the trap, and the hydrocarbon content is calculated from this data.

2 SCOPE AND APPLICATION

This method is applicable for the determination of hydrocarbon, water and solids content of oily byproduct samples primarily from Heavy Oil operations.

3 SAMPLE HANDLING AND PRESERVATION

- 3.1 Samples should be subsampled from the field containers (usually a 20 L polyethylene bottle)
- 3.2 Visually examine sample, record ratio of free water to solids.
- 3.3 Decant and discard any free water in the sample container.
- 3.4 Remove all large rocks, twigs or vegetation.
- 3.5 On the remaining oily byproduct material, obtain a homogenous mixture using an appropriate method suitable for the type of material received. One of the following methods may be used:
 - 3.5.1 Mix by shaking in the sample container.
 - 3.5.2 Mix by manual stirring in the sample container or a large non-contaminating tray using a plastic or teflon-coated rod.
 - 3.5.3 Mix by mechanically stirring using a teflon coated probe or paddle.

NOTE: large clusters of material remaining after following one of the above methods should be broken down by hand and incorporated into the sample.

- 3.6 Collect a 2 Kg. aliquot of the homogenized sample and place in a clean glass jar (1 L) with a teflon lined lid. Store sample at 4°C. to minimize losses of volatile components and to reduce biodegradation.
- 3.7 Collect a subsample from the 1 L glass jar by first mixing the contents with a durable glass rod and then collecting the sample using a glass tube and rod subsampling device. At this stage, other subsamples should be collected for material density (kg/m^3), metal and 1:9 water soluble extract analysis. Refer to the specific methods for further instructions.

4 APPARATUS AND MATERIALS

- 4.1 Condenser - A tube condenser approximately 400 mm long with a 24/40 standard taper (Fisher cat # 07-736C or equivalent).
- 4.2 Distillation trap - A trap with 24/40 standard taper joints constructed so that the water is separated from the solvent, and the solvent is recycled back into the distillation apparatus (Fisher cat # 09-147-5 or equivalent).
- 4.3 Distillation flask - A 1 litre 45/50 standard taper flask. The flask may be either a single necked round bottomed flask (no current Fisher cat #) or a single necked erlenmeyer flask (Fisher cat # 10-048C or equivalent).
- 4.4 Extraction Thimble - Whatman 85 x 200 mm cellulose thimble, single thickness.
- 4.5 Heat Source - Either a CSA approved heating mantle or a hot plate to accommodate the distillation flask.
- 4.6 Boiling Beads - Inert glass boiling beads to control bumping.
- 4.7 Balance - Top loading balance to 0.001 g, 400 g capacity.
- 4.8 Drying Oven - Forced air oven set at 105°C.
- 4.9 Desiccator
- 4.10 Toluene - A.C.S. reagent grade

5 INTERFERENCES

- 5.1 Humic materials found in soils may give false positive readings. If suitable controls such as uncontaminated soils from the area of origin of the sample are available, sample blanks should be performed.

6 SAMPLE PREPARATION AND ANALYSIS

6.1 Procedure

- 6.1.1 Dry the thimbles in the drying oven for a minimum of 8 hours. Cool the thimbles in the desiccator for a minimum of 20 minutes, weigh to the nearest 0.001 g. Record this weight as the initial dry weight of the thimble.
- 6.1.2 Ensuring that the sample is homogeneous, add approximately 30 to 40 g of sample to the thimble, weigh to the nearest 0.001 g. Record this as the weight of the thimble plus sample.
- 6.1.3 Assemble the distillation apparatus as shown in Figure 1, ensure that all joints are vapour tight.
- 6.1.4 With water flowing through the reflux condensers, turn the hot plate or heating mantle to a medium heat setting, this will start the reflux.
- 6.1.5 The toluene will boil and immerse the thimble in hot vapour. As the material in the thimble is heated, the water in the sample will be vaporized and be carried along with the hot solvent vapours to the condenser where they will be cooled and fall back into the distillation trap. The water will fall to the bottom of the trap, and the solvent will be recycled back into the distillation apparatus. The hydrocarbon portion of the sample will be dissolved in the hot solvent vapour, and drip from the bottom of the thimble.
- 6.1.6 The extraction is complete when the water level in the trap remains constant, and the solvent dripping from the thimble is clear. Depending on the nature of the sample, this may take from 1 to 8 hours or more.
- 6.1.7 Terminate the extraction and allow the solvent and apparatus to cool.
- 6.1.8 Measure the volume of water that is retained in the distillation trap to the nearest 0.1 mL. Record this volume as the volume of water.
- 6.1.9 Dismantle the distillation apparatus and remove the thimble.
- 6.1.10 Dry the thimbles in the drying oven for a minimum of 8 hours. Cool the thimbles in the desiccator for a minimum of 20 minutes, weigh to the nearest 0.001 g. Record this weight as the final weight of the thimble.

6.2 Preparation of Quality Control samples

6.2.1 The quality control sample should be handled exactly the same as the samples for analysis.

6.3 Instrument Calibration and Operation

6.3.1 The balance used to weigh the whatman thimbles must be calibrated on a routine basis using class S analytical weights. The results of the calibration are to be recorded in a log book, and are to be available at all times.

7 SAFETY AND HEALTH CONSIDERATIONS

7.1 This method uses a hot, moderately toxic solvent that is highly flammable. Extreme caution must be used when performing this procedure. Major safety concern to address prior to performing the distillation include;

7.1.1 Ensuring that the standard taper joints are secure so that they will not leak solvent vapours.

7.1.2 Ensure that the electrical outlets will not be exposed to the solvent in the event of flask breakage.

7.1.3 Glassware and solvent have cooled sufficiently prior to dismantling the distillation apparatus.

7.2 Toluene - Moderately toxic by inhalation and skin absorption. Possesses irritant and anesthetic properties. Highly flammable. Use under a fume hood.

8 QUALITY CONTROL

8.1 External Standard - Use a material that is similar to the oily byproduct. This may be a previous sample that has been analysed a minimum of 20 times, and statistical quality control methods have been utilized on the resulting data.

8.2 Frequency - An external standard must be analysed with every set of samples.

8.3 Evaluation - The external standard must fall within 2 standard deviations of the mean calculated from the 20 data points.

8.4 Corrective Actions - Should the external standard not fall within 2 standard deviations, the standard must be re-analysed, and the samples that were analysed at that time must be re-analysed.

9 DATA GENERATION AND CALCULATIONS

$$9.1 \quad \% \text{ Solids} = \frac{S}{W} \times 100$$

$$9.2 \quad \% \text{ Water} = \frac{V}{W} \times 100$$

$$9.3 \quad \% \text{ Hydrocarbon} = 100 - (\% \text{ Solids} + \% \text{ Water})$$

where: S = the final weight of the solids after the reflux is completed.

V = the volume of water retained in the trap, mL. The density of water is assumed to be 1.0 kg/L

W = the sample weight = (initial weight of thimble + sample) - (initial weight of the thimble)

9.4 Use the standard report form as supplied (see attached "Oily Byproduct Characterization for Road Disposal Data Sheet") to report all data.

10 PRECISION AND ACCURACY

10.1 Each laboratory involved in oily byproduct material analysis by this protocol must provide precision and accuracy data with each sample report.

11 REFERENCES

11.1 Syncrude Analytical Methods for Oil Sand and Bitumen Processing, Syncrude Canada Limited, 1979

11.2 The Reclamation of Agricultural Soils After Oil Spills, Part 1: Research, University of Alberta, Department of Soil Science, 1977



ACID DIGESTION OF SEDIMENTS, SLUDGES, AND SOILS: US EPA 3050 (SW 846)

1 SUMMARY

This method is an acid digestion procedure used to prepare sediments, sludges, and soil samples for analysis by flame or furnace atomic absorption spectroscopy (FLAA and GFAA, respectively) or by inductively coupled argon plasma spectroscopy (ICP). Samples prepared by this method may be analysed by ICP or FLAA for metals including cadmium (Cd), mercury (Hg), nickel (Ni), copper (Cu) and zinc (Zn). GFAA can be used to analyse only Cd. Mercury (Hg) should be analysed using flameless atomic absorption spectroscopy (AAS).

An alternate equivalent method may be used for all or some of the metals specified above if precision and accuracy cannot be achieved as indicated in section 10.0.

2 SUMMARY OF METHOD

A representative 1-2 g (wet weight) sample is digested in nitric acid and hydrogen peroxide. The digestate is then refluxed with either nitric acid or hydrochloric acid. Dilute hydrochloric acid is used as the final reflux acid for the ICP or flame analysis of Cd, Pb, Ni and V. Dilute nitric acid is employed as the final dilution acid for furnace AA analysis of Cd, and Pb. A separate sample shall be dried for a solids determination.

3 SAMPLE HANDLING AND PRESERVATION

- 3.1 Samples should be subsampled from the field containers (usually a 20 L polyethylene bottle or container).
- 3.2 Decant and discard any free water in the sample container.
- 3.3 Remove all large rocks, twigs, or vegetation.
- 3.4 On the remaining oily byproduct material, obtain a homogeneous mixture using an appropriate method suitable for the type of material received. One of the following methods may be used:
 - 3.4.1 Mix by shaking in the sample container.
 - 3.4.2 Mix by manual stirring in the sample container or a large non-contaminating tray using a plastic or teflon coated rod.
 - 3.4.3 Mix by mechanically stirring using a teflon coated probe or paddle.

NOTE: large clusters of material remaining after following one of the above methods should be broken down by hand and incorporated into the sample.

- 3.5 Collect ~ 2 kg aliquot of the homogenized sample and place in a clean glass jar (2 L) with a teflon lined lid. Store sample at 4°C to minimize losses of volatile components and to reduce biodegradation.
- 3.6 Collect a subsample from the 1 L glass jar by first mixing the contents with a durable glass rod and then collecting the sample using a glass tube and rod subsampling device. At this stage, other subsamples should be collected for 1:9 Water Soluble Extract and Composition. Refer to the specific methods for further instructions.

4 APPARATUS AND MATERIALS

4.1 Instrumentation

- 4.1.1 Inductively Coupled Plasma Spectrophotometer (ICP) and/or an Atomic Absorption Spectrophotometer (AAS).
- 4.1.2 Drying ovens that can be maintained at 30° C, thermometer that covers the range from 0 to 200° C, Whatman No. 41 filter paper (or equivalent), watch glasses.
- 4.1.3 Conical teflon beakers (PFA, Dupont or equivalent) vessels with teflon covers (Fisher Scientific or Dupont).
- 4.1.4 Analytical balance, 0.001 g accuracy, 400 g capacity.
- 4.1.5 Centrifuge, centrifuge tubes.
- 4.1.6 Glass tube and rod subsampling device

4.2 Reagents

- 4.2.1 Nitric acid (HNO₃), ACS reagent grade.
- 4.2.2 Hydrochloric acid (HCl), ACS reagent grade.
- 4.2.3 Hydrogen Peroxide (H₂O₂), ACS reagent grade.
- 4.2.4 Demineralized water, Type II, Standard Methods for the Examination of Water and Wastewater.

NOTE: Trace Metal Grade reagents for acids may give better results than ACS grade.

4.3 Reference Materials

- 4.3.1 Coal fly ash, NIST SRM 1633a, (National Institute of Science and Technology)
- 4.3.2 River sediment, NIST SRM 2704 (National Institute of Science and Technology)
- 4.3.3 Blended oil standard, S-12 (Conostan)

5 INTERFERENCES

- 5.1 Oily byproduct samples which cannot be easily homogenized might not yield suitably precise data. In such situations, the analyst is advised to contact the Energy Resources Conservation Board at (403) 297-2450 for information on dealing with such characterization problems.

6 SAMPLE PREPARATION AND ANALYSIS

- 6.1 Mix the sample thoroughly to achieve homogeneity. For each digestion procedure, weigh to the nearest 0.01 g and transfer to a conical beaker a 1.00 to 2.00 g portion of sample.
- 6.2 Add 10 mL of 1:1 HNO₃, mix the slurry, and cover with a watch glass. Heat the sample to 95° C and reflux for 10 - 15 minutes without boiling. Allow the sample to cool, add 5 mL of concentrated HNO₃, replace the watch glass, and reflux for 30 minutes. Repeat this last step to complete oxidation. Using a ribbed watch glass, allow solution to evaporate to 5 mL without boiling, while maintaining a covering over the bottom of the beaker.
- 6.3 After step 6.2 has been completed and the sample has cooled, add 2 mL of Type II water and 3 mL of 30% H₂O₂. Cover the beaker with a watch glass and return the covered beaker to the hot plate for warming and to start the peroxide reaction. Care must be taken to ensure that the losses do not occur due to excessive vigorous effervescence. Heat until effervescence subsides and cool the beaker.
- 6.4 Continue to add 30% H₂O₂ in 1 mL aliquots with warming until the effervescence is minimal or until the general sample appearance is unchanged.

Note: do not add more than a total of 10 mL 30% H₂O₂.

- 6.5 If the sample is being prepared for the ICP or flame AA analysis, then add 5 mL of concentrated HCl and 10 mL of Type II water, return to the covered beaker to the hot plate, and reflux for an additional 15 minutes without boiling. After cooling, dilute to 100 mL with Type II water. Particulates in the digestate that may clog the nebulizer should be removed by filtration, by centrifugation, or by allowing the sample to settle.

- 6.5.1** Filtration: Filter through Whatman No. 41 filter paper (or equivalent) and dilute to 100 mL with Type II water.
- 6.5.2** Centrifugation: Centrifugation at 2000 - 3000 rpm for 10 minutes is usually sufficient to clear supernatant.
- 6.5.3** The diluted sample has an approximate acid concentration of 5.0% (v/v) HNO₃ and 5.0% (v/v) HCl. The sample is now ready for analysis.
- 6.6** If the sample is being prepared for the furnace analysis of Cd and Pb, cover the sample with a ribbed watch glass and continue heating the acid-peroxide digestate until the volume has been reduced to approximately 5 mL. After cooling, dilute to 100 ml with Type II water. Particulates in the digestate should then be removed by filtration, by centrifugation, or by allowing the sample to settle.
- 6.6.1** Filtration: Filter through Whatman No. 41 filter paper (or equivalent) and dilute to 100 mL with Type II water.
- 6.6.2** Centrifugation: Centrifugation at 2000 - 3000 rpm for 10 minutes is usually sufficient to clear supernatant.
- 6.6.3** The diluted sample has an approximate acid concentration of 5.0% (v/v) HNO₃. For analysis, withdraw aliquots of approximate volume and add any required reagent or matrix modifier. The sample is now ready for analysis.

7 SAFETY AND HEALTH CONSIDERATIONS

Analysts or other laboratory personnel involved in oily byproduct analyses should exercise standard laboratory safety practices. Noxious fumes of hydrogen sulfide and light end hydrocarbons may be present in oily byproduct material.

This method uses very corrosive acids and powerful oxidizing chemicals for the digestion of the oily byproducts. Personal protective equipment required includes: a full face shield, gloves, lab coat, and a protective apron. Special attention must be given to the equipment and facilities required. The safety and the acceptable method performance can be achieved only if the appropriate facilities and expertise are afforded to these analyses. Some of the requirements for a number of the chemicals used in this procedure are listed below.

- 7.1** Hydrochloric acid is extremely corrosive to body tissues even during brief exposures. When heated, it emits highly corrosive fumes and will react with water or steam to produce toxic and corrosive fumes.
- 7.2** Nitric acid is an extreme irritant and can destroy tissues, stain skin, and damage eyes. A moderate fire hazard, it will react violently with many substances including: acetic acid, ammonia, carbon, organic matter, and sodium compounds. When heated to decomposition, it will give off fumes of NO_x and hydrogen nitrate.

- 7.3 Hydrogen peroxide is an extreme irritant and can destroy tissue, stain skin, and damage eyes. When heated it will emit toxic fumes.

8 QUALITY CONTROL

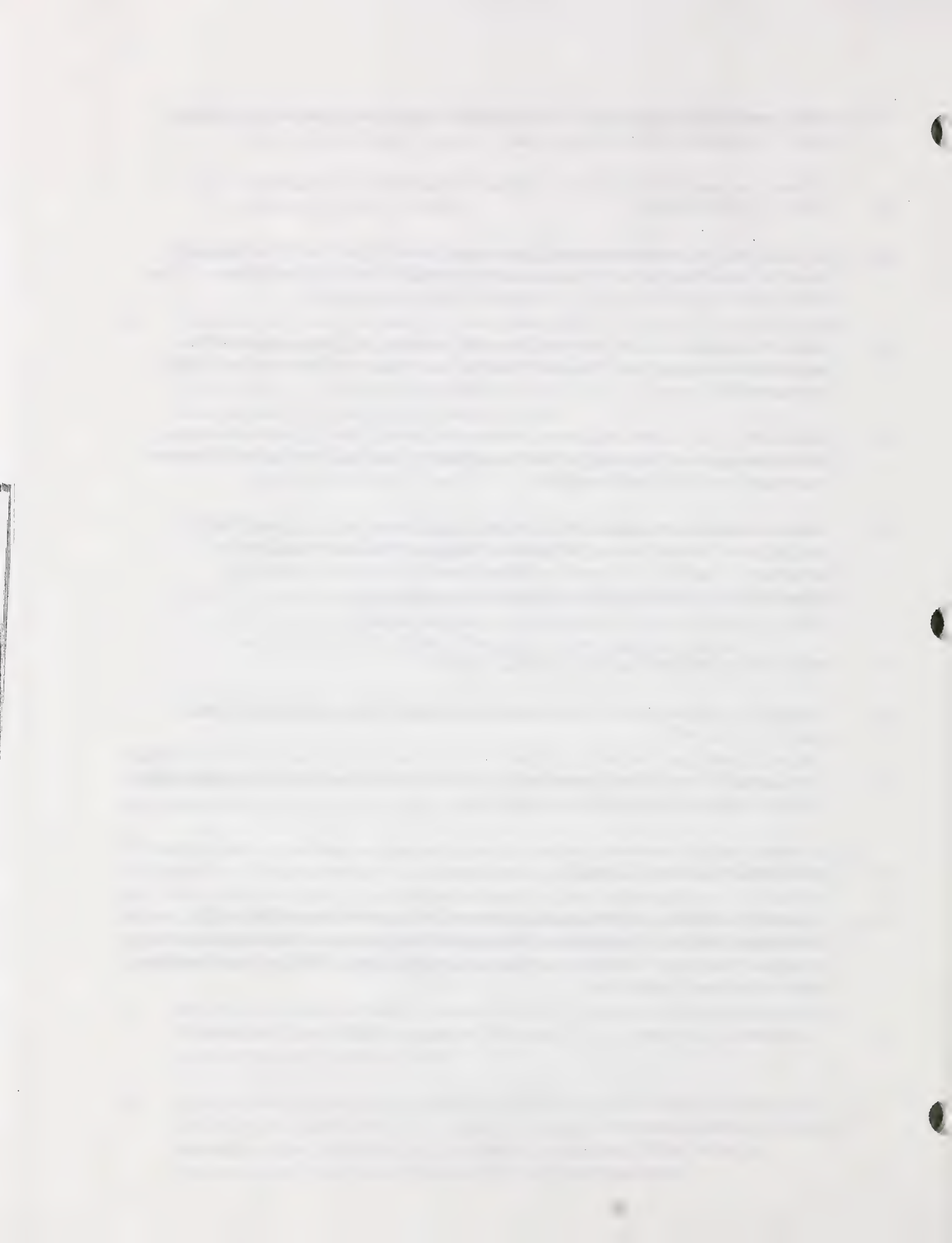
- 8.1 For each group of samples processed, preparation blanks (Type II water and reagents) should be carried throughout the entire sample preparation and analytical process. These blanks will be used in determining if samples are being contaminated.
- 8.2 Duplicate samples should be processed on a routine basis. Duplicate samples will be used to determine precision. The sample load will determine the frequency, but 10% is recommended.
- 8.3 Spiked samples or standard reference materials must be employed to determine accuracy. A spiked sample should be included with each group of samples processed and whenever a new sample matrix is being analysed.
- 8.4 All pertinent instruments should be calibrated in accordance with the manufacturers specific procedure and checked for precision using a calibration standard for the instrument in question. The operation of each instrument should be within the parameters set in the user guide provided by the manufacturer.

9 DATA COLLECTION AND CALCULATIONS

- 9.1 Calculate the concentrations for Cd, Hg, Ni, Cu, Zn and Pb in mg/kg in the original sample "as received".
- 9.3 Use the standard report form as supplied (see attached "Oily Byproduct Characterization for Road Disposal Data Sheet") to report all data.

10 PRECISION AND ACCURACY

- 10.1 The current data base for precision and accuracy for this method as applied to Oily Byproducts is lacking. The success of this program is dependant on the data generated during each sampling. Normally, a relative standard deviation of ~33% or less should be expected between 3 replicates.



OILY BYPRODUCT CHARACTERIZATION FOR ROAD DISPOSAL DATA SHEET

Laboratory Name: _____

Lab Sample Number: _____ Date Received: _____

Field Sample Number: _____ Date Analysed: _____

| Sample Information | |
|--|---|
| Company: _____ | Source: (eg ecology pit, desand tank etc.) |
| Location: Lsd — — — W M | Description: (eg oily sand, slop oil etc.) |

| Composition (Dean Stark) | Extractable Salts (1:9 Dilution) | | |
|-------------------------------------|-------------------------------------|---------------|--|
| Oil % | pH | SC | dS/M |
| Solids % | | Concentration | Calculated Depth of Application ² |
| H ₂ O % | Na mg/L | mg/Kg | cm |
| Density of Sample kg/m ³ | Cl mg/L | mg/Kg | cm |

| Total Metals (US EPA 3050 (SW 846)) | | | | | |
|-------------------------------------|---------------|-----------|---------------|-----------|---------------|
| | Concentration | | Concentration | | Concentration |
| Cadmium/Cd | mg/Kg | Nickel/Ni | mg/Kg | Lead/Pb | mg/Kg |
| Mercury/Hg | mg/Kg | Zinc/Zn | mg/Kg | Copper/Cu | mg/Kg |

Maximum application depth _____ cm (least "Calculated Depth of Application" from above).

The undersigned hereby certifies that the information is accurate and in accordance with the requirements of Information Letter IL 95-4.

Signed: _____ (Laboratory) _____ (Operator)

¹Sample must not contain halogenated hydrocarbons, hazardous chemicals, refined or lube oils flare pit sludges or deleterious substances such as filters, rags, vegetation and other debris including significant volumes of contaminated agricultural soils.

²The calculated depth of application for each constituent is determined as follows:

$$d \text{ (cm)} = \frac{L \times 10^4}{D \times C}$$

where: d = depth (cm) - calculated
 L = loading rate (kg/ha) - specified in section 2.4 for Na and Cl
 D = density of sample (kg/m³) - determined by laboratory
 C = concentration (mg/kg) determined by laboratory

This represents the calculated maximum depth of oily sludge (prior to mixing with aggregate) allowed, without exceeding each parameter limit specified in section 2 of the information letter. Your maximum allowed application depth is the smallest of the two calculated values and total metals concentration must not exceed these values specified in section 2.5. You must also follow the Recommended Standards of Practice.





INFORMATIONAL LETTER IL 95-5

TO: Energy Industry

30 May 1995

MEMORANDUM OF UNDERSTANDING ON ADMINISTRATIVE PROCEDURES FOR PUBLICATION OF NOTICE OF APPLICATION

As both Alberta Energy and Utilities Board (AEUB) and Alberta Environmental Protection (AEP) are required to provide notice under their respective legislation, the AEUB and AEP have developed a memorandum of understanding on the administrative procedures for publication of notice of applications.

To reduce cost to the applicant and to avoid confusion of two notices, the coordinated procedures will be used when there are concurrent applications for approval to the AEUB and AEP. The decision of a joint notice will be by mutual agreement between the AEUB and AEP.

The attached Memorandum of Understanding identifies the criteria for using the coordinated process and also outlines the administrative procedure. Also attached is an example of a joint notice.

Signed by the Deputy Minister,
Alberta Environmental Protection

Signed by the Chairman
Alberta Energy and Utilities Board

MEMORANDUM OF UNDERSTANDING ON ADMINISTRATIVE PROCEDURES FOR PUBLICATION OF NOTICE OF APPLICATIONS BETWEEN ALBERTA ENERGY AND UTILITIES BOARD (AEUB) and ALBERTA ENVIRONMENTAL PROTECTION (AEP)

MADE this 30th day of May, 1995

ADMINISTRATIVE PROCEDURES FOR PUBLICATION OF NOTICE OF APPLICATIONS

BACKGROUND



The AEUB, pursuant to section 29 of the Energy Resources Conservation Act (ERCA), is required to provide notice to any one who may be directly and adversely affected by an activity for which an application is made to the AEUB.

An AEP Director, pursuant to section 69 of the Environmental Protection and Enhancement Act (EPEA), may require the applicant to provide notice to the public of an application for an approval.

Therefore the AEUB and AEP agree to coordinate their requirements for giving of notice according to the following administrative procedures.

ADMINISTRATIVE PROCEDURES

1. The administrative procedures will be used when there are concurrent applications for approval to the AEUB and AEP.

2. The AEP Director or designated representative, and the AEUB Manager or application coordinator, will inform the other party of receipt of an application under their respective legislation which may require notice because of potential issues.

3. AEP will promptly advise the AEUB coordinator and confirm in writing that the application to AEP has undergone an initial review and that the Director has decided that:

- (a) the application is considered complete as defined in the Regulations, and the applicant has been directed to publish notice; or
- (b) the notice of the application has been waived under Section 69(3) of EPEA (there is an emergency; the application is considered routine; or there has been adequate prior notice of the matter); or
- (c) the application should be considered for a joint AEUB/AEP notice.

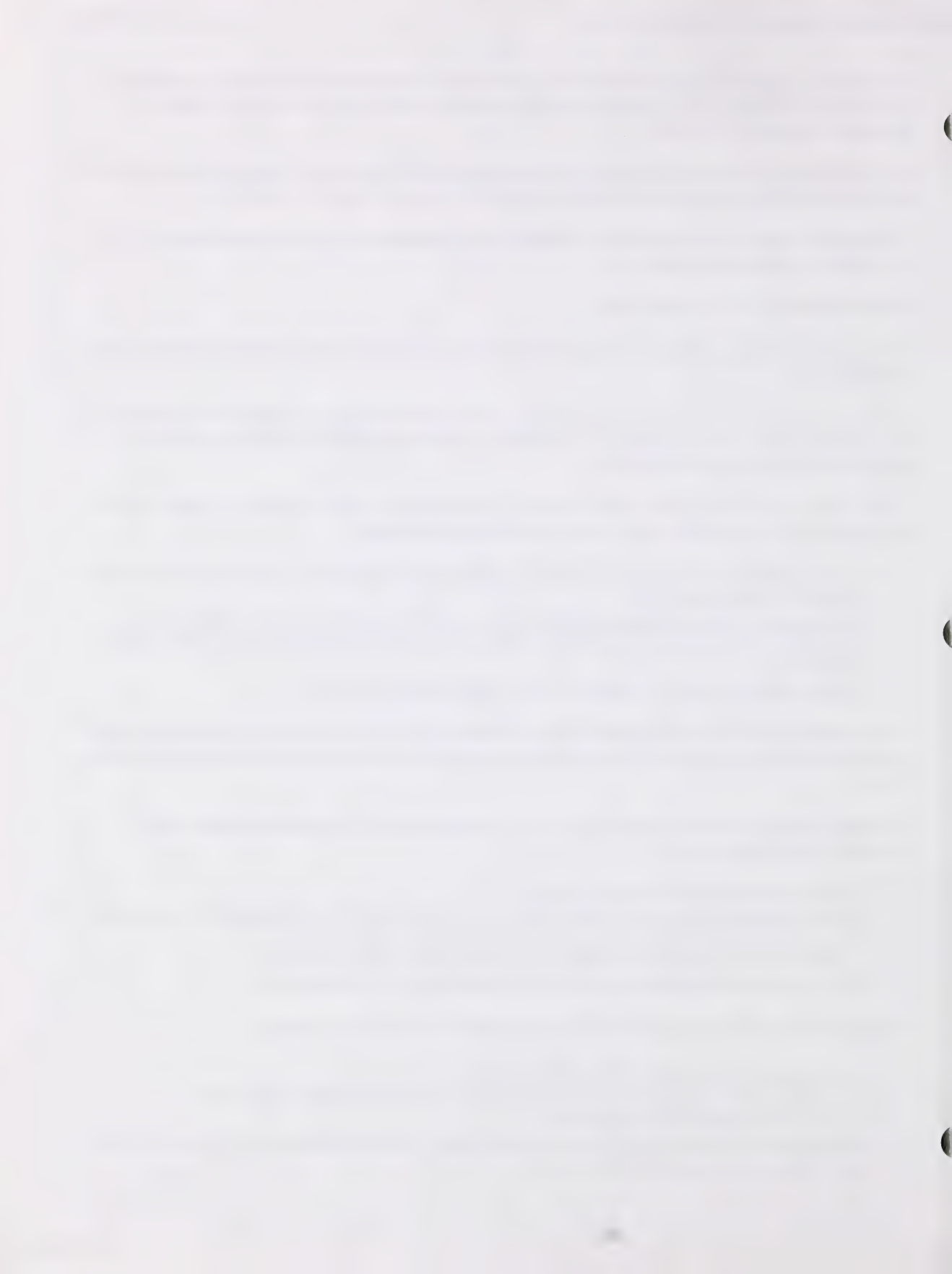
4. The AEUB will promptly advise AEP if the application to the AEUB will likely require publication of notice for objection or hearing. AEP may delay their notice to coincide with the AEUB notice (see 5(b) below).

5. When a joint notice is being considered, the final decision should be by mutual agreement after consultation with the applicant on

- (a) the timing of issuance of any approvals;
- (b) the response time to a joint notice. If the EPEA requirement for a minimum of 30 days notice does not meet AEUB requirements, then separate notices should be given;
- (c) the value of a joint notice to the applicant, the public, AEUB, and AEP;
- (d) any variation from form or content of the standard notice of either party.

6. The joint notice shall contain, the standard information of each party, including:

- (a) the scope of jurisdiction of the AEUB and AEP;
- (b) mention of all the applications to the AEUB and AEP and respective legislation.
- (c) a brief description of the applications.
- (d) Letters of Objection should go to General Counsel, AEUB and Statements of Concern should go to the appropriate AEP Director, and;



- (e) specific closing date for responses.

7. The AEUB and AEP will exchange all Letters of Objection and Statements of Concern when a joint notice is given.

8. On concurrent applications, when a joint notice is not given:

- (a) each party will provide the other a copy of any notice published under their respective legislation; and
- (b) there will be a complete exchange of all Statements of Concern to AEP and Letters of Objection to the AEUB.

The need and effectiveness of the Memorandum of Understanding will be reviewed by the parties within 12 months of implementation.

The Memorandum of Understanding shall come into effect on the 8th day of June, 1995.

Signed by the Deputy Minister,
Alberta Environmental Protection

Signed by the Chairman
Alberta Energy and Utilities Board

Example - Use as Guide

NOTICE

AREA

ALBERTA ENERGY AND UTILITIES BOARD

APPLICATION NO.

ALBERTA ENVIRONMENTAL PROTECTION

APPLICATION NO.

COMPANY NAME

TAKE NOTICE that unless objection by a person having a bonafide interest in the matter is filed on or before (date) _____, with the General Counsel, AEUB and with the applicant at its address set out below, the Alberta Energy and Utilities Board may grant an application pursuant to section ___ of (related legislation) _____ by (company name- Applicant) _____ for (purpose of application) _____.

The applicant proposes (brief description of project covering the development and environmental aspects)

AND FURTHER TAKE NOTICE that pursuant to section 70 of the Environmental Protection and Enhancement Act, any person who is directly affected by the Alberta Environmental Protection



Application may submit a written statement of concern regarding the application within 30 days of the date of this advertisement. The statement of concern, quoting the AEP Application No., must be submitted to:

Director of (Division Name)
Department of Environmental Protection
Regulatory Approvals Centre
Main Floor, 9820 - 106 Street
Edmonton, AB T5K 2J6

Copies of the application and information and particulars filed in support thereof may be obtained by interested persons from the applicant, (Name and address of applicant) _____

AND FURTHER TAKE NOTICE that submissions relating exclusively to compensation for land usage are beyond the jurisdiction of the Alberta Energy and Utilities Board or Alberta Environmental Protection.

DATED at Calgary, Alberta on _____.

ALBERTA ENERGY AND UTILITIES BOARD
Michael J. Bruni, General Counsel
640 - 5 Avenue S.W.
Calgary, AB T2P 3G4

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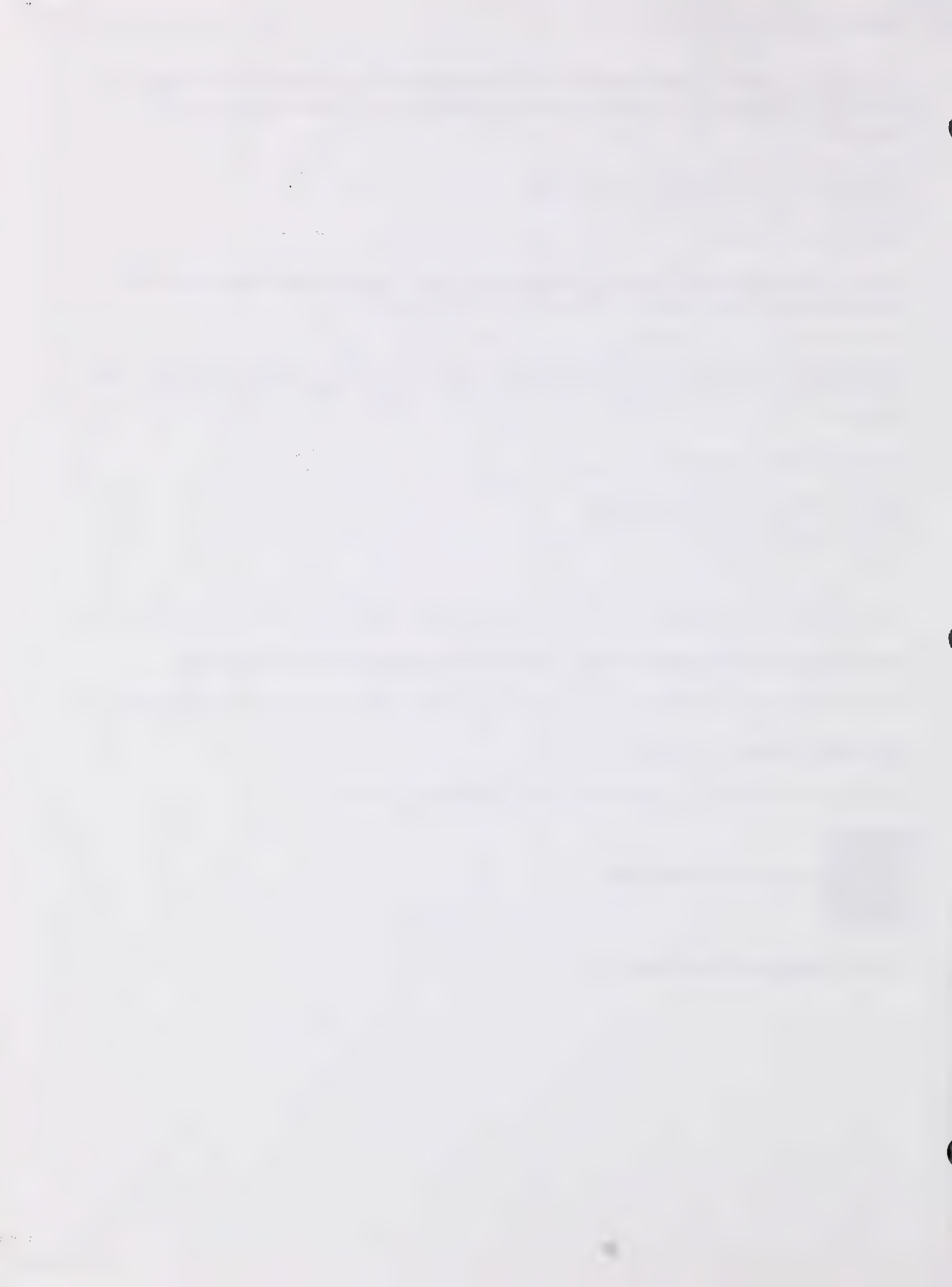
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Please direct any questions or comments to: aeubsys@mail.eub.gov.ab.ca



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INFORMATIONAL LETTER IL 95-6

TO: All Oil and Gas Operators

22 August 1995

IMPLEMENTATION OF FACILITY ACTIVITY STATEMENT (FAS)

The Ministry of Energy, industry, and the Partner Regulatory Information Data Exchange (PRIDE), have been working on a number of related initiatives to streamline and simplify administrative procedures and data reporting. The purpose of these initiatives is to achieve cost savings to government and industry by eliminating duplication and unnecessary reporting. Staff of the Alberta Department of Energy, the Alberta Energy and Utilities Board and PRIDE are working cooperatively on these initiatives and are appreciative of the assistance and input from across industry. The Ministry is endeavouring to keep industry informed of the progress being made and of any delays encountered.

One of the initiatives involves the replacement of the "S" documents with a new form called the Facility Activity Statement (FAS), which would be used for reporting production information.

The purpose of this Informational Letter is to advise that **the Ministry of Energy will not be implementing the new Facility Activity Statement beginning the production month of 1 January 1996, as originally planned.** The postponement is the result of difficulties with the Department of Energy's new gas royalty administration system. These difficulties are currently being addressed by the Department of Energy and the Alberta Energy and Utilities Board. The Ministry will continue to consult with industry regarding the future of the FAS form and its implementation. The Owner Activity Statement (OAS) and "S" documents will continue to be used to record and manage volumetric information. The Ministry of Energy apologizes for any inconvenience created by this decision.

Requests for further information may be directed to:

Ken Gerig
Gas Royalty Operations
Operations and Support Division
Alberta Department of Energy
Petroleum Plaza, North Tower
8th Floor, 9945 - 108 Street
EDMONTON, AB T5K 2G6

Telephone: (403) 427-2962

Production Processing Help Desk
Alberta Energy and Utilities Board
640 - 5th Avenue SW

CALGARY, AB T2P 3G4

Telephone: (403) 297-2580

Facsimile: (403) 297-7303

David Luff
Assistant Deputy Minister
Alberta Department of Energy

Lorne Fredlund
Chief Operating Officer
Alberta Energy and Utilities Board

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Energy Resources
Conservation Board

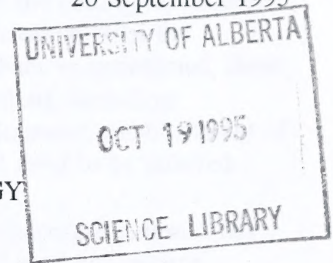
640 Fifth Avenue SW
Calgary, Alberta
Canada T2P 3G4

Informational Letter

IL 95-07

TO: All Subdivision and Development Approving Authorities
Alberta Urban Municipalities Association
Alberta Association of Municipal Districts and Counties

20 September 1995



SUBDIVISION AND DEVELOPMENT REGULATION REQUIREMENTS FOR REFERRALS TO THE ALBERTA ENERGY AND UTILITIES BOARD (AEUB)

Section 5(1)(g) and section 9 of the new Provincial Subdivision and Development Regulation require that subdivision-approving and development-approving authorities refer applications to the AEUB, if any of the land that is the subject of the application is located within 1.5 kilometres of a sour gas facility. The new regulation allows the AEUB and the municipalities to agree to modest setbacks in certain circumstances. This informational letter will outline some basic guidelines which approving authorities should use to reduce the number of referrals required to be sent to the AEUB.

Energy Resources Conservation Board Interim Directives ID 81-3 and ID 87-2 outline minimum setback requirements between sour oil and gas facilities and surface development which oil and gas operators must meet. Section 2.110(1) of the Oil and Gas Conservation Regulations states that a well, sweet or sour, may not be drilled within 100 metres (m) of a surface improvement. These regulations are strictly enforced by the AEUB to ensure that the public is not exposed to undue risk.

Prior to the new Subdivision and Development Regulation, section 6(1)(j) of the Provincial Subdivision Regulation required that municipal planning authorities refer applications to the AEUB to ensure that similar sour gas setbacks to those in ID 81-3 and ID 87-2 were imposed on proponents wishing to subdivide. In the past, the same rules have not been applied to development where subdivision was not necessary, nor has the standard 100-m restriction been enforced. To afford the public the same level of protection, the Board urges municipal authorities to enforce the setback conditions regardless of whether the land being developed is required to be subdivided or not.

Therefore, the AEUB has requested that the same setbacks which have been imposed on oil and gas operators and on those wishing to subdivide land, also apply to development.

The AEUB understands the concerns of planning authorities to refer development permit applications, however, it is possible to greatly reduce the number of referrals municipal authorities are required to send to the AEUB by following these guidelines:

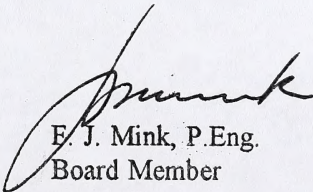
- The setback distance required between subdivision or development having a density of eight or less dwellings per quarter section and a well is always 100 m regardless of whether the well is sweet or sour. The required setback distance from a sweet or a Level 1 sour pipeline and a development density of eight or less dwellings per quarter section is the distance of the pipeline right-of-way, and from a Level 2 to Level 4 sour pipeline is 100 m. Setbacks from pipelines are measured from the centre line of the pipeline to the edge of the dwelling. The 100-m setback is measured from the wellhead to the edge of the dwelling. As long as a 100-m setback is maintained, there would be no need to refer the application. Only those applications, including subdivision applications, resulting in a greater density of development, establishment of a public facility, or those where a potential conflict exists, will need to be referred.
- Subdivision and development permit applications for infill development unless it has been predetermined that an area is sensitive (eg. N.E. Calgary), will not require referral.

Using these guidelines would eliminate approximately 60 per cent of the referrals currently sent to the AEUB. When an application is referred, AEUB staff will provide the municipal planning authority with the most current sour gas information available. In cases where a possible conflict exists, the oil and gas operator should be contacted to confirm the sour gas level designation of the facilities noted.

AEUB staff have recently streamlined the referral review process. The average turnaround time for processing a referral is 10 days from the date it is received to the date that a response is sent. In special circumstances it is possible to provide a response in much less time.

The AEUB is aware that in some municipalities certain types of development can take place without a permit. The AEUB believes that the municipality must be responsible for ensuring that its ratepayers are notified of the minimum 100-m setback requirement and that encroachment does not take place.

Any questions regarding these guidelines can be directed to the AEUB's Environment Protection Department at 297-3194.



E. J. Mink, P.Eng.
Board Member

The AEBU understands the concerns of planning authorities to test development permit applications, however, it is possible to greatly reduce the number of referrals in single categories as required to meet the AEBU by following these guidelines.

The setback distance required between subdivision or development having a density of eight or less dwellings per parcel, section and a wall is always 100 m regardless of whether the wall is west or east. The required setback distance from a wall of a Level 1 town pipeline and a development density of eight or less dwellings per parcel is the diameter of the pipeline right-of-way, and from a Level 2 or Level 3 town pipeline is 100 m. Setbacks from pipelines are measured from the centre line of the pipeline to the edge of the dwelling. The 100-m setback is measured from the wall to the edge of the dwelling. As long as a 100-m setback is maintained, there would be no need to refer the application. Only those applications, including subdivisions applications, resulting in a greater density of development, installation of a public facility, or those where a potential conflict exists, will need to be referred.

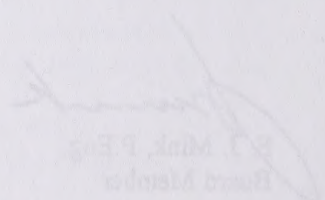
Subdivisions and development permit applications for infill development which have been predetermined that an area is sensitive (eg. N.E. Calgary) will not require referral.

Using these guidelines would eliminate approximately 50 per cent of the referrals currently sent to the AEBU. When an application is referred, AEBU staff will provide the municipal planning authority with the most current zoning information available. In cases where a possible conflict exists, the oil and gas operator should be contacted to confirm the zoning level designation of the facility in question.

AEBU staff have recently streamlined the referral review process. The average turnaround time for processing a referral is 10 days from the date it is received to the date that a response is sent. In special circumstances it is possible to provide a response in much less time.

The AEBU is aware that in some municipalities certain types of development can take place without a permit. The AEBU believes that the municipality must be responsible for ensuring that its regulations are notified of the minimum 100-m setback requirements and that enforcement does not take place.

Any questions regarding these guidelines can be directed to the AEBU's Environment Protection Department at 297-3194.


S. J. Mink, P. Eng.
Board Member