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DOMINION ANTHRACITE LTD.

REPORT ON

**A PROJECT DEVELOPMENT PLAN
AND COST ESTIMATE FOR THE
GROUNDHOG COAL PROPERTY**

JUNE 1986



**Phillips
Barratt
Kaiser**

Engineering Ltd.



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06 June 1986
Our File: 86064

Dominion Anthracite Ltd.
#904 - 675 West Hastings Street
Vancouver, B.C.
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Attention: Mr. A. Reeve

Dear Sirs:

**Re: Groundhog Coal Project
Development Plan Cost Estimate**

Enclosed is the cost estimate and development plan review for your Groundhog Coal Project. To summarize, we have arrived at a total cost of \$2,650,000 and 25 calendar months to bring the project up to implementation defined as detailed design, construction, project financing and final licensing.

We have drawn heavily from our general experience with projects like this and have specifically chosen our involvement with a similar project near yours as the basis for our cost and time estimates.


We view any mining project as being based on a sound knowledge of its geological parameters. This is why we have allocated about 60% of the total cost towards geological investigations. Many mining projects that develop problems do so because their geological base was incomplete, so assumptions had to be made to replace hard data. In this context, we include as geological all sampling, analysis and testing.

As instructed by you, we have assumed that the Mount Klappan Project will be proceeding, so our infrastructure costs for your project are only enough to connect it with Mount Klappan's network.

We enjoyed doing this report for you and would be pleased to discuss it at your convenience. Thank you for giving us the opportunity to work on your project.

Yours truly,

**PHILLIPS BARRATT KAISER
ENGINEERING LTD.**


J.E. Dagenais, P. Eng.
Vice President, Mines

JED/jg

Encl.

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PROJECT DEVELOPMENT PLAN

GROUNDHOG COAL PROPERTY

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1.0 INTRODUCTION

Dominion Anthracite Ltd. has requested Phillips Barratt Kaiser to produce cost estimates for all phases of development as provided by the client and to review a project development plan for the Groundhog Coal property.

The following sections outline such a plan including cost estimates for the various phases, along with an expected duration of each phase. A summary of the phases and tasks is outlined in Figure 1 at the end of the report.

The estimates are based on PBK historical costs supplemented by budget estimates from suppliers. The phase duration times are based on past project histories.

2.0 DEVELOPMENT PROGRAM

Coal projects in British Columbia have generally followed similar development programs from discovery to commercial operation. Each has its own unique characteristics dependent upon many factors, but the following is considered typical.

I Preliminary Geological Evaluation

The first phase of any program is to assess the deposit and attempt to estimate reserves, coal quality and potential mining and processing problems. This evaluation usually consists of outcrop sampling, trenching, test pitting, wide spaced drilling, photogrammetry and topographical surveys and geological mapping. The information gathered must be enough to allow reasonable estimates of reserves to formulate a mining plan and assess coal preparation requirements.

II Prefeasibility Study

The prefeasibility study is undertaken to assess the overall viability and economics of the project. All aspects are evaluated on a preliminary basis using assumptions and data accumulated during the preliminary geological assessment, historical data and other similar studies and projects. This study will include:

- Definition of the project scope
- Reserves estimate
- Conceptual mining plan
- Processing schemes
- Infrastructure requirements
- Marketing
- Capital and Operating Costs
- Economics

During the study, alternates will be addressed for various segments of the project and decision analysis techniques will be applied to the majority rather than detailed assessments. This approach reduces costs and the time required for the study.

III Stage I Report

All mining projects in British Columbia are required to file, at a minimum, a Stage I Report with the Provincial Government outlining all aspects of the project and its implications and effects on the area and the province. This report is to contain:

- A description of existing environmental and social conditions
- Project descriptions, including options and alternates
- Environmental and social impacts
- Proposed further studies

This Stage I Report is reviewed by various Government departments and agencies to form the basis of their requirements for final licensing and permitting. Stage I reports and assessments are

generally carried out by environmental consulting firms experienced in the field.

This phase would start during the prefeasibility study and be completed at approximately the same time. The time for government review is a minimum of three months and can be up to six.

IV Detailed Geological Evaluation

If the prefeasibility study and government response, etc. indicate that further evaluation of the project is warranted, the next and most important phase is a detailed geological evaluation. This will include:

- Definitive drilling including geophysical logging
- Detailed geological mapping
- Reserve estimates
- Trenching and test pitting
- Laboratory testing
- Bulk sampling from adits
- Pilot testing
- Environmental background data collection

V Feasibility Study

The detailed feasibility study will be completed using the detailed geological information and revised project scope. The same items will be covered as in the prefeasibility study, but carried out to a much greater level of detail and accuracy and further evaluation of alternates. Capital and operating costs will be based on preliminary designs for mine planning, coal processing and infrastructure. The final report will serve as the basis for project financing, permitting and detailed design and construction.

VI Market Study

At the same time as the feasibility study is conducted, a detailed marketing evaluation should be undertaken by a recognized consultant in coal marketing. This study will confirm market evaluations done during the prefeasibility study and provide credible market data for project financing.

VII Environmental Impact Assessment

A comprehensive environmental impact assessment (EIA) must be completed by an environmental consultant based on the government's response to the Stage I Report. This report will form the basis for the permits required and must be completed in the detail required if the project proceeds. During the feasibility study and the environmental impact assessment, it is important that informal contact be maintained with the government and its agencies to inform them of the progress and criteria that is to be used. This will

allow their feedback to be included in the study and EIA such that if the project does proceed, permits and licenses are not delayed because of some regulatory requirement.

The EIA will be undertaken in the same time frame as the feasibility study and feedback is required between both studies.

3.0 ESTIMATED DEVELOPMENT COSTS

3.1 Cost Summary

The following summarizes the cost of the development program.

	<u>Cost, \$,000</u>
I Preliminary Geological Evaluation	\$ 300
II Prefeasibility Study	60
III Stage I Report	40
IV Detailed Geological Evaluation	1,225
V Feasibility Study	750
VI Market Study	75
VII Environmental Impact Assessment	<u>200</u>
Total	\$ 2,650

3.2 Basis of Estimate

I Preliminary Geological Evaluation

The estimated cost is based on verbal quotations and in-house data on mapping of two new licenses, trenching and sampling, 10 drill holes including geophysical logging, laboratory test work and taking basic environmental measurements.

II Prefeasibility Study

This cost is as outlined in the PBK proposal to Laramide Resources Ltd. of October 21, 1985.

III Stage I Report

This cost is based on PBK in-house data and is the minimal requirement for a Stage I Report.

IV Detailed Geological Evaluation

The cost allowed in this phase is based on verbal quotations, in-house and historical data and includes 40 holes at an average depth of 100 meters, laboratory test work for washability and physical data, environmental data collection, geophysical logging, bulk sampling from three major adits supplemented by eight inch core drilling. Pilot testing is assumed to be completed at an off-site test facility and the cost includes shipping of bulk samples.

V Feasibility Study

The estimated cost is based on in-house data on studies completed in the same area on coal properties.

VI Market Study

This cost is based on historical data and is considered a minimum expenditure.

VII Environmental Impact Assessment

The estimate is very dependent on the response of the government and its various agencies on the Stage I Report and the requirements that it puts forward for the EIA and subsequent permitting. The cost allowed for in this phase are based on previous studies and historical data.

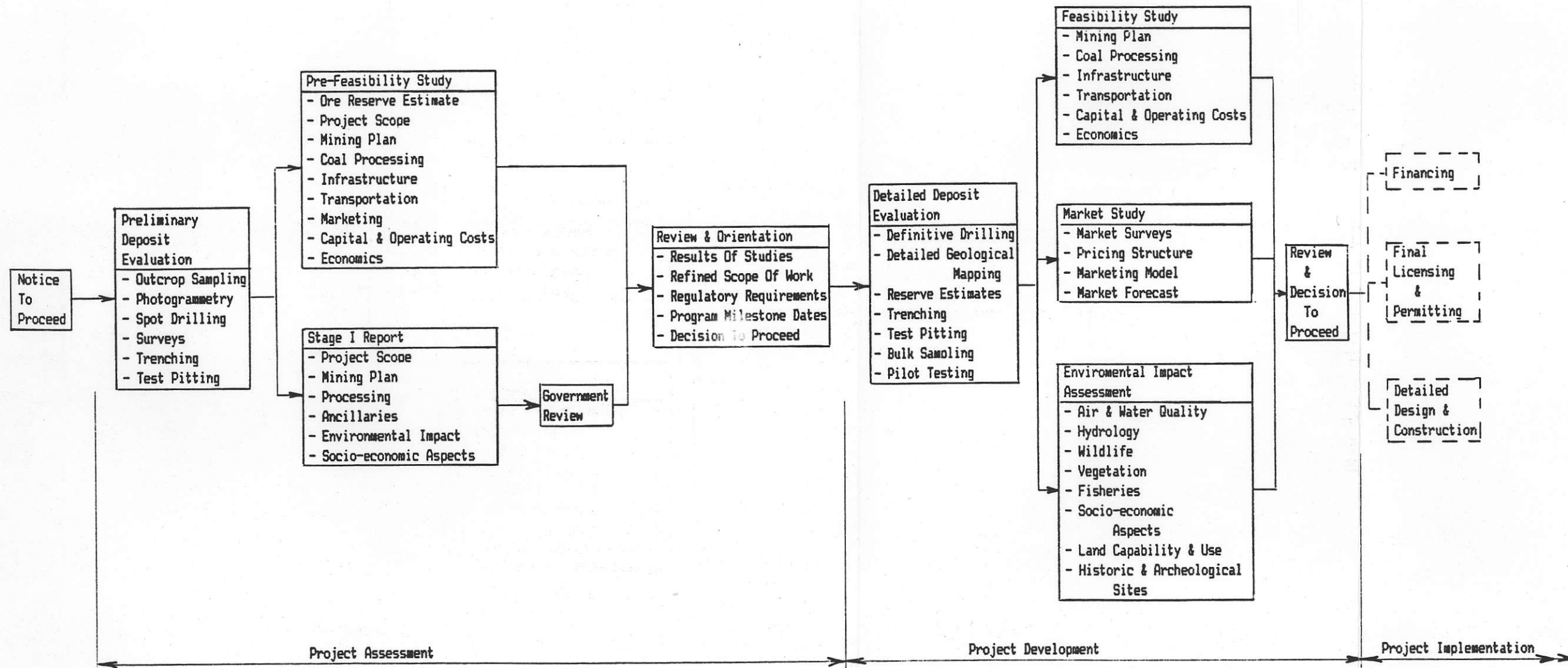
4.0 PROJECT DEVELOPMENT SCHEDULE

The following are approximate durations of the individual phases and are based on typical time frames from historical data and previous project histories. These durations can vary considerably depending on numerous factors and does not allow for any excessive delays in any one phase.

		<u>Time, months</u>	
		<u>Phase</u>	<u>Cumulative</u>
I	Preliminary Geological Evaluation	4	4
II	Prefeasibility Study	2	6
III	Stage I Report	2	6
	Government Review	5	11
	Owner Review and Orientation	4	11*
IV	Detailed Geological Evaluation	8	19
V	Feasibility Study	9	25*
VI	Market Study	4	25*
VII	Environmental Impact Assessment	6	25*

* Phases that overlap or are concurrent.

Figure 2 on the next page outlines an overall schedule.



Dominion Anthracite Ltd.

Groundhog Coal Development