

January 20, 2004

Paramount Resources Ltd.
Attention: Shirley Maaskant
4700 Bankers Hall West
888 3rd Street SW
Calgary, Alberta
T2P 5C5

Dear Ms. Maaskant,

RE: Additional Round 2 Information Requests

The Review Board has issued an additional five Information Requests to Paramount Resources Ltd., based on a recent submission by the Government of the Northwest Territories and Environment Canada.

Please find enclosed a copy of the additional requests. Responses must be submitted to the MVEIRB office by **5:00 p.m. Friday, January 30, 2004.**

Should you require any additional information, please do not hesitate to contact Kimberley Cliffe-Phillips, the Environmental Assessment Officer for this project at: (867) 766-7062.

Sincerely,

A handwritten signature in blue ink, appearing to read "Vern Christensen".

Vern Christensen
Executive Director

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IR Number: 1.2.131
Source: Environment Canada & Environmental Protection Service, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories
To: *Paramount Resources*
Issue : H₂S composition of gas

Preamble

The H₂S percentage of the gas used as fuel is a critical component in determining the values of SO₂ emissions from the varied equipment operating at the Cameron Hills facility. It is, therefore, vital that the H₂S percentages not be under-estimated and that the modelling represent 'worst case' emission scenarios. Appendix III Tables III-1 to 5, 12 and 18 to 21 indicate that the estimated H₂S percentages are based on only one round of gas sampling conducted on July 3, 2003. Although a certain element of conservatism was introduced by slightly increasing the sample results, basing the estimates on only one sample day does not inspire confidence that the full potential range of percentages have been captured. It is assumed that over the numerous years that the Cameron Hills facility has been in operation, gas sampling has been conducted and that these results could be used to better assess the potential range of H₂S percentages for the various fuel gas types. It is noted that in a recent submission of their Emergency Response Plan for the Cameron Hills facility (revised July 2003), Paramount estimates the H₂S percentages for all existing gas and oil wells at 3% (Table 3.4) - a figure in excess of any of the estimates used in the DAR.

It is our understanding that Paramount is required to submit the results of their gas analysis to the National Energy Board on a regular basis for review. Independent confirmation of the range of H₂S percentages for the various sources of fuel gas used at the Cameron Hills facility would provide a greater level of comfort regarding the SO₂ emission estimates.

Request

Paramount:

1. Confirm the basis for the estimated H₂S percentages in the various fuel sources. Were they based on only one round of samples?
2. Are additional (historical) analyses of fuel gas available to better represent the potential range of H₂S percentages in the fuel gas? If so, why was the July 3, 2003 sampling chosen as the sole source of information?

3. Over the course of time, and as various wells become depleted, is the percentage of H₂S likely to change (i.e. increase)? If so, are the H₂S values used in the emission estimates sufficiently conservative to account for this scenario?

IR Number: 1.2.132
Source: Environment Canada & Environmental Protection Service, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories
To: *Paramount Resources*
Issue : **NO_x emissions**

Preamble

The NO_x emissions estimates for the central battery (0.142 t/d) provided in Table 7.2-8 of the "Developers Assessment Report for the Paramount Cameron Hills Extensions", September 2003, are less than 25% of the NO_x emissions reported for the central battery (0.6224 t/d) in Table 5-9 of the "Environmental Impact Assessment for the Cameron Hills Gathering System and Facilities Project", April 2001.

Request

- 1) Do these reports describe the same gathering system and central battery?
- 2) Please explain why the NO_x emissions have been reduced by 75%. Are there significant design changes or different assumptions made in estimating NO_x emissions?

IR Number: 1.2.133
Source: Environment Canada & Environmental Protection Service, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories
To: *Paramount Resources*
Issue : **Model inputs**

Preamble

The quality of modelling predictions is dependant on the input data used in the model. Since the modelling predictions for 1-hour SO₂ concentrations are within 98% of the NWT Ambient Air Quality Standards, we feel it is important to review the input files used to generate the modelling predictions. To be complete we would like to review input data for each pollutant modelled and each emission scenario with the respective control files and output files.

Request

Please provide all input and output data files plus control files used to generate model predictions for each pollutant and each emission scenario: Baseline, Application and Planned Development Cases.

IR Number: 1.2.134
Source: Environment Canada & Environmental Protection Service, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories
To: *Paramount Resources*
Issue : Mitigation of SO₂ emissions

Preamble

As part of the Canada-wide Standards for PM and Ozone, the Government of Canada and the Government of the Northwest Territories have recognized that polluting "up to a limit" is not acceptable and that the best strategy to avoid future problems is Keeping Clean Areas Clean (KCAC). The KCAC strategy encourages the pollution prevention approach (e.g. the use of best management practices and best available technology) to minimize emissions and environmental impacts.

The foot notes attached to tables of stack heights for line heaters and pumpjacks, Tables III-8, -10, -24 and -26, state:

"A standard line heater stack height of 6.1m was assumed. Stack heights associated with concentrations in excess of the NT standards were increased to comply with NT standards."

and

"A standard pumpjack stack height of 3m was assumed. Stack heights associated with concentrations in excess of the NT standards were increased to comply with NT standards."

The proposed stack heights for line heaters ranged from 6.1m to 19m and stack heights for pumpjacks ranged from 3m to 8.5m. It appears that there were many exceedances predicted under the original stack configurations. Subsequently, the proponent ran multiple iterations of the model with increased stack heights until all concentrations were under the ambient standards. Even with this extreme modelling and configuration exercise, the maximum predicted 1-hour SO₂ concentrations are still within 98% of ambient standards for each emission scenario.

We are concerned that the proponent is configuring stack heights so that model predictions meet ambient guidelines rather than trying to mitigate emissions. This "solution to pollution is dilution" approach essentially results in a polluting "up to a limit" scenario and is contrary to the approach advocated under the Canada-wide Standards process and KCAC strategy. It should be noted that Tables III-8 and -

10 (the Baseline Case) indicate that potential exceedences of the NWT SO₂ standards could be occurring now under the current stack configurations for the existing line heaters and pumpjacks. Clearly there is a sulphur issue that needs to be addressed.

In the Baseline Case and Application Case, maximum SO₂ concentrations are predicted to occur very close to the central battery facility. In the Planned Development Case, the proponent introduces an amine sweetening unit which reduces the central battery SO₂ emissions estimates to 7% of the Baseline and Application Cases. However, no timeline is provided for the installation of this equipment and, although the predicted SO₂ concentrations near the central battery are greatly reduced in the Planned Development Case, SO₂ levels in other areas are still within 99% of ambient standards. Perhaps further benefits could be achieved by using the sweetened fuel for all combustion engines such as the line heaters and pumpjacks.

Request

In the spirit of Keeping Clean Areas Clean, we recommend that the proponent install the amine sweetening unit as soon as technically possible rather than at some as yet undefined date in the future and use the sweetened fuel in all combustion engines. Please provide a timeline for installation along with new emissions estimates and SO₂ predictions assuming that all combustion engines will use the sweetened fuel.

IR Number: 1.2.135
Source: Environment Canada & Environmental Protection Service, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories
To: *Paramount Resources*

Issue: Air monitoring

Preamble

Air dispersion models are used to identify potential air quality issues due to local emissions. If potential issues are identified then an air quality monitoring program is required to ensure that the environment is protected. Despite the apparent effort the proponent has made to minimize modelled concentrations, the SO₂ concentrations are still predicted to be within 98% of ambient standards. We recommend that a monitoring program be implemented for the lifetime of this project. The monitoring program should be developed by the proponent through consultation with government agencies and stakeholders.

Request

Please prepare a draft monitoring program and initiate the consultation process.