

December 2, 2022

Office of the Regulator of Oil and Gas Operations (OROGO)
Department of Justice
Government of the Northwest Territories
P.O. Box 1320
Yellowknife NT
X1A 2L9
Canada

Via Email Only

Attn: Pauline de Jong
Regulator

Re: Information Request No. 5: Proof of Financial Responsibility
(OA-2019-002-MGM)

MGM Energy Ltd. (MGM) provides the following response to OROGO's Information Request #5.

As per previous submissions, MGM considers the worst-case scenario is the environmental (and thus financial) risk associated with the project is a diesel spill.

MGM expects that clean-up would be done in the same year as any spill. As no diesel fuel will be left on site at the close of operations, any spill would be during the time the location was occupied and thus would be noted and addressed immediately, as would be completed by any prudent operator.

Attached is MGM's Risk Assessment, Mitigations and Cost Estimation December 2022 for well abandonment work under OA-2019-002-MGM. The assessment includes a description of potential impacts, an estimate of loss and damage, and a table in Appendix 1 that details the breakdown of the cost estimate prepared by Heenan Engineering Services. It assumes alignment with a Sahtu benefit plan to have the clean-up crew stay at accommodation in Colville Lake Lodge and the local B&B would not be at capacity with tourist traffic in the winter. This solution results in faster response, has less environmental impact, and is more cost effective than setting up a camp for a short period.

The worst-case scenario estimation results in a total clean-up cost of \$562,166.

Please contact me if you require addition information regarding this assessment.

Respectively,
MGM Energy Ltd.

A handwritten signature in black ink, appearing to read "John Hawkins".

John Hawkins, P. Eng.
Director, Asset Management
403-817-5074

Risk Assessment, Mitigations and Cost Estimation December 2022 Central Mackenzie Valley Well Abandonment Operations OA-2019-002-MGM

Scope:

This assessment documents the worst-case scenarios with potential risks to the environment and associated mitigation costs associated with the above Operations Authorization. For ease of analysis, these are grouped into two broad categories.

- Risks associated directly with the well/wellhead and failure of the associated containment systems. (Well Related Risks)
These risks are unique to petroleum exploration, production, and related operations.
- Risks associated with surface operations (e.g. fluid spills). These are similar for any industrial operation of similar scope. (Surface Risks)

Well Related Risks

Any operation involving petroleum wells entails a potential risk of uncontrolled flow (up to and including a “blowout”).

For the operations proposed, the probability of an uncontrolled flow is considered extremely small for the following reasons.

1. The well is cased from top to bottom. Unlike drilling operations, no formations are open to the wellbore, except through the perforations in the casing. This factor alone, significantly reduces the potential risk of an uncontrolled flow.
2. The downhole pressure is known as the wells have been completed and tested. The pressure gradient in the wells is in the order of 9.9kPa/m and the wells will be killed with potassium chloride solution.
3. The industry best practice for well control is a “Two Barrier” approach. In this case there are always two barriers in place.
 - a. Primary Barrier – hydrostatic head of the column of fluid in the well.
The density of the fluid will be controlled so that the hydrostatic head exceeds the known bottom hole pressure for each well.
Once the plug(s) required for abandonment are placed and tested, the well will be displaced to fresh water as required by OROGO.
 - b. Secondary Barrier – A downhole plug set in a profile nipple above the producing zone and/or a back-pressure valve in the tubing hanger. These will be replaced by the service rig blowout preventers (BOPs) on the well during operations.

Despite the low possibility of an uncontrolled flow, the potential severity of the occurrence needs to be considered, in the unlikely event that one should occur.

The effect on the environment and more particularly, mitigation costs would be small for the following reasons:

- 1) The well is sweet with no detection of hydrogen sulfide in the gas analysis.
- 2) There were no significant liquid hydrocarbons reported in the produced gas.

Surface Risks

All Program activities will be confined to ice pads or ice roads which will facilitate thorough clean-up of any accidental spills and protect soils from erosion and contamination.

The following potential spills were identified, and the associated spill prevention/mitigation procedures are listed

- **Diesel Fuel/Gasoline**

Diesel Fuel is the primary fuel source on location. Tanks up to 30 m³ may be used to store fuel on location. Fuel will be stored in double walled tanks to minimize the risk of a catastrophic spill. Automatic shut-off nozzles and drip trays will be used for fueling to minimize the risk of minor spills.

Should a spill occur, it would be on the ice pad, limiting contamination and facilitating clean-up. Diesel fuel will be transported to location by truck.

Spill contingency supplies and equipment as detailed in the Land Use Permit application will be on site, in addition to the routine construction and road maintenance equipment (e.g. front-end loader). MGM Energy, through its parent company, Paramount Resources Ltd, is a member of the Mackenzie Delta Spill Response Coop (MDSRC). The majority of the MDSRC equipment is currently stored in Norman Wells (reflecting industry activity). In the event of a serious spill, additional equipment would be obtained from this source.

- **Vehicle Fluids (lube oil, hydraulic fluid, antifreeze)**

Drip trays will be placed under vehicles parked for an extended period of time but there is a remote possibility of a mechanical failure resulting in a spill of one of the above fluids. Lube oil and hydraulic oil spills would be minor as the volume of fluid is small and it would be expected to remain on the ice pad surface, facilitating cleanup and preventing contamination of the land. A spill of antifreeze (engine coolant) may penetrate the ice pad due to its properties, requiring removal of more contaminated material. Environmental effects are predicted to be negligible due to minimal volumes (up to 50 liters for a large truck).

- **Drilling Fluids (mud, brine, etc.)**

No drilling fluids are planned for this operation. The wells will be killed with a potassium chloride (KCl) in freshwater solution (typically 3%). Any spill of the dry KCl will be easily scrapped up with any associated ice/snow. Liquid product will be stored in tanks with

secondary containment. As the location will always be attended, any potential spill during transfer operations would be detected and addressed immediately. The spill would then be cleaned up with on-site equipment. At the concentrations planned (3%) the KCl has a relatively high freezing point (-2 C) compared to the anticipated ambient temperature. This will facilitate cleanup before significant penetration of the protective ice pad.

- **Gray Water and Sewage**

Due to the remote location, one or more camps will be required. Grey water and/or sewage will be stored in tanks on location, and either treated on site and/or trucked to an approved disposal location. Any spill would be cleaned up with onsite equipment immediately. Residual environmental effects are predicted to be negligible.

- **Cement**

A small amount of cement will be used in the abandonment process. The cement will be mixed and used. The largest volume used at one time (limited by the size of the mixing tanks) is approximately 3m³. There is negligible risk of ground contamination due to the nature of mixed cement. Should any of the mixed cement or dry powder be spilled it will be easily cleaned up from the ice surface.

- **Acid and Chemicals**

No acid or other chemicals are currently planned for this operation.

- **Radioactive Materials**

No radioactive sand or other tracers are planned for this program.

Discussion and Recommendations

Considering the above, the worst-case scenario for the environmental (and thus financial) risk associated with the project is that of a diesel fuel spill. As noted, it is expected that any spill would be confined to the location and limited to the surface of the ice pad. There is also the possibility of a spill associated with a transportation incident. In this event there would be no ice pad, but a mitigating factor would be the smaller amount of fuel in the truck.

Due to the remote location and limited size, the “actual loss or damage” would be expected to be limited to the cost of cleanup and local (onsite) mitigation. Due to the precautions above and the fact that the site will be occupied almost continuously during operations, the risk of a spill of the full volume of diesel on site is considered very unlikely but is used below as a worst-case scenario.

To estimate the magnitude cost of cleaning up and remediating a spill we assume:

- 10 days of work by 6 laborers plus indirect costs and accommodation results
- 100 m³ of contaminated material disposed of at a BC licensed waste facility
- Equipment will be onsite from construction and road maintenance activities and additional equipment will be first sourced in Colville, Fort Good Hope, Norman Wells, Fort Liard and if necessary British Columbia as required.

The above worst-case scenario assessment addresses the most likely event to occur with the highest potential for actual loss or damage as a result of a diesel fuel spill. An estimate of the maximum reasonable cost to control and mitigate this event is included in Appendix 1. As described, a worst-case scenario event would be of limited area and clean up would be of short duration. For these reasons, Paramount believes that any loss or damage as defined in 63(3) of the Oil and Gas Operations Act (OGOA) would be minimal and the cost associated with such an event would be essentially limited the cleanup of the spill. Paramount does not believe that there are any other significant risks with potential for loss or damage as defined in the OGOA

In consideration of:

- The above risk analysis
- MGM/Paramount's insurance policy(s) applicable to this operation
- MGM/Paramount's financial strength as evidenced by the Financial Statements provided as part of the Operations Authorization
- MGM/Paramount's past well abandonments performance

Paramount believes there is sufficient proof of financial responsibility and there is no need to post additional security to abandon the wells. However, if OROGO assesses the requirement Section 63(1)(a) of the OGOA differently, Paramount is prepared to issue an Irrevocable Letter of Credit (ILC) as additional evidence of Financial Responsibility. A sample ILC was provided to OROGO as part of the OA submission.

Appendix 1

Cost estimate to Mitigate Worst Case Scenario Spill

Initial Clean-up - winter**10 days**

Resource	Unit Cost	Units	Days	Costs
Supervisor	\$ 1,500	2	10	\$30,000
Labour	\$ 600	6	8	\$28,800
Loader/cat	\$ 3,000	1	8	\$24,000
Vaccum/Steam truck Combo Unit	\$ 3,000	2	8	\$48,000
Accomodation	\$ 500	10	10	\$50,000
Consumables	\$ 2,000	1	8	\$16,000
Transport waste to BC Waste Facility	\$ 30,000	2	1	\$60,000
Waste disposal	\$ 18,000	1	5	\$90,000
Environmental Crew	\$1,000	2	8	\$16,000
Lab Analysis	\$ 5,000	1	1	\$5,000
Project Management, Regulatory & Administration costs @ 10%				\$36,780.0
Total Initial Clean up				\$404,580

Summer Clean-up - Monitor**4 days**

Inspection - Minor clean up

Resource	Unit Cost	Units	Days	Extension
Supervisor	\$ 1,500	1	4	\$6,000
Labour	\$ 600	4	4	\$9,600
Air transportation	\$ 2,000	1	2	\$4,000
Accommodations	\$ 300	5	4	\$6,000
Consumables	\$ 1,000	1	4	\$4,000
Helicopter	\$ 9,000	1	1	\$9,000
Lab analysis	\$ 1,000	1	4	\$4,000
Project Management, Regulatory & Administration costs @ 10%				\$4,260
Total Summer 1				\$46,860

Follow up - year 2**Vegetation Monitoring**

Resource	Unit Cost	Units	Days	Costs
On site personnel	\$ 5,000	1	4	\$20,000
Lab analysis	\$ 1,000	1	1	\$1,000
Helicopter	\$ 9,000	1	1	\$9,000
Flights etc	\$ 4,000	1	1	\$4,000
Project Management, Regulatory & Administration costs @ 10%				\$3,400
Total				\$37,400

Summary

Phase				
Initial Clean-up				\$404,580
Summer 1	Inspection/clean up			\$46,860
Summer 2	Vegetation	Monitoring		\$37,400
Contingency (15%)				\$73,326
TOTAL				\$562,166