



OPERATOR: AURORA RESEARCH INSTITUTE
**MALLIK GAS HYDRATE PRODUCTION
RESEARCH PROGRAM**
WINTER 2006-2008

The Mallik Gas Hydrate Production Research Project is a two-year research initiative to advance the scientific understanding of natural gas hydrates. The project is located at the Mallik L-38 drilling site on Richards Island, in the Mackenzie Delta. The drill site is located along the near shore floodplain on the western side of Mallik Bay, directly west of West Point, 65 km from Tuktoyaktuk, and 128 km from Inuvik.

A project description for the two-year drilling program was submitted to the Inuvialuit Environmental Impact Screening Committee in August 2006, and approved in September 2006. Additional territorial and federal permits for the project were granted in the fall of 2006.

The Aurora College/ Aurora Research Institute (ARI) is the operator of the project, on behalf of the Japan Oil, Gas and Minerals National Corporation (JOGMEC), and Natural Resources Canada (NRCan). JOGMEC and NRCan are jointly funding the project. Project management and engineering services are being provided by Inuvialuit Oilfield Services (IOFS).

Winter 2006-2007 Activities

In the first winter of operations, construction activities commenced as scheduled in December 2006 with ice road construction from the government ice road at Tununuk Point (Bar C) to Harry Channel and the project site. The drilling camp was set up on site on January 30, 2007, and the Mallik 2L-38 well was re-entered on February 15, 2007. A short production test was conducted at the Mallik

2L-38 well in April, which included limited flaring over 3 days of testing. The Mallik 3L-38 well was deepened to be used as a water injection well for winter 2007-2008 operations. A new monitoring well had been proposed as part of the 2006 project description. However, time constraints resulted in the well not being drilled, though a shallow casing (20 m) and a cellar were installed at the proposed well location. Demobilization of equipment was completed by April 20, 2007. Site inspections have been conducted weekly by ARI staff and minor clean-up activities will continue through the summer.

The project did not use a sump for drilling waste. Drilling waste was shipped out of the Mackenzie Delta. The sumless drilling program required additional handling and transfer of drilling waste, which presented some operational challenges. As a result, some small spills occurred, and were recorded, reported and cleaned up as per territorial and federal regulations. Lessons were learned through the 2006-2007 operations that will be used to improve environmental performance on the project in 2007-2008, such as the need for increased equipment inspections and more training.

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Winter 2007–2008 Activities: Staging

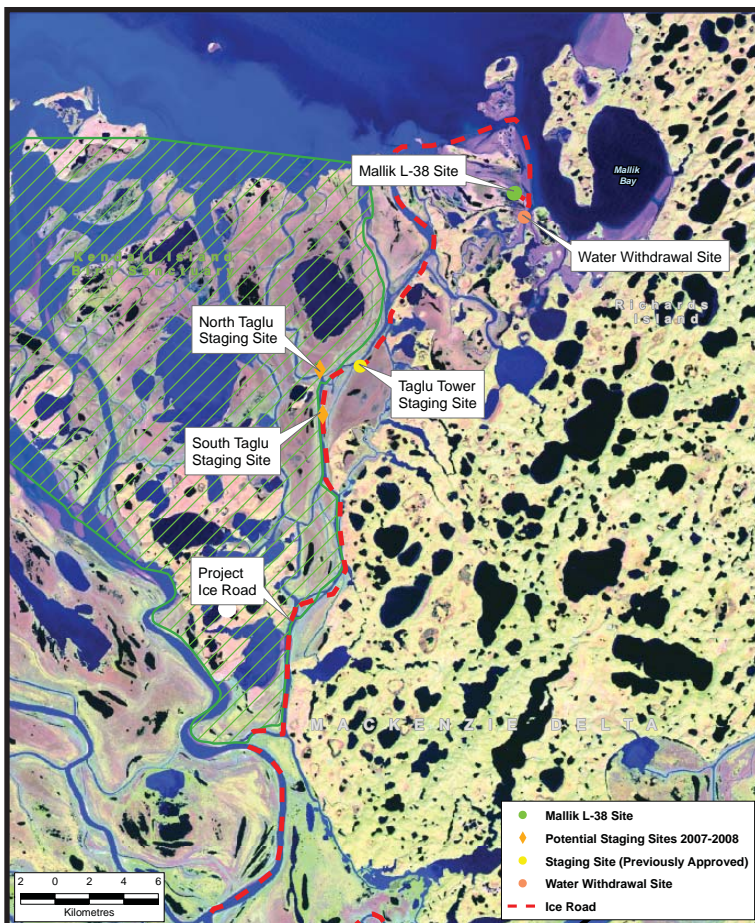
The second year of project activities will start in mid-September 2007 with barging of equipment to the staging site. The 2006 project description identifies the Taglu Tower site, located on the east side of Harry Channel, as the main staging site. The site, which dates from the early 1970's, consists of previously disturbed sediments, covered with sand and gravel. Two usable areas of the gravel pad have been identified: one adjacent to Harry Channel, and the other set about 100 m from the river. Project plans are to stage equipment in both areas using swamp matting or rig matting to cross areas of concern.

As a contingency, to expand the area available for staging, the project team is looking at a number of options, including the use a small staging site, referred to as South Taglu, located about 3 km south of the Taglu Tower site. While not expected at this time, there is a possibility that additional staging space will be required. A staging site referred to as the North Taglu staging site was used for the previous Mallik drilling program in 2001. As the North Taglu site is located within the Kendall Island Bird Sanctuary, the use of this site would likely require screening by the Inuvialuit Environmental Screening Committee.

All of these sites are existing staging sites, and none of these options would result in new disturbance. Barges will be removed once the equipment has been off-loaded.

Mallik Field Operations

Consistent with the approved project description, the plans for the 2007-2008 season include re-entering the Mallik 2L-38 well for a longer production test. Production activities are expected to begin about January 1, 2008 with 60 to 90 days of testing. The Mallik 3L-38 well will be used for downhole disposal of produced water. Produced sand will be trucked out of the Mackenzie Delta to the same disposal facility which accepted the drill cuttings last winter. No new drilling activities are planned. Equipment will be demobilized by ice road using trucks upon completion of the project.



Sump Monitoring Program

Although the project is not using a drilling waste sump, the Environmental Impact Screening Committee recommended that the project team undertake a monitoring program of drilling waste sumps installed in 1998 and 2002 as part of previous research and development programs. Starting in August 2007, as a separate activity from the Mallik Gas Hydrate Production Research Project, ARI and the Geological Survey of Canada will collaborate on a multidisciplinary research program. As part of this program, temperature cables were installed at both disturbed and undisturbed sites in March 2007. Consistent with a recent 'Best Practices' guide released by Indian and Northern Affairs Canada, the following activities are planned:

- monitoring of ground temperatures of disturbed and undisturbed sites (data loggers will be installed on thermistor cables drilled previously installed)
- monitoring of active layer depths
- water and soil sampling (to determine the chemical composition of both)
- electro-magnetic surveys (ground surveys to map out thawed zones and saline areas associated with sumps)
- development of a plan for re-vegetation of the sump caps with native seed mix (re-vegetation will likely occur in summer 2008)

This work will involve a small number of technicians who will be onsite for about 7-10 days. The technicians will be supported by helicopter and will camp at the site. A wildlife monitor will be employed during the field work. With the exception of use of a small generator, no machinery is required onsite. Future sump work may involve importing fill to the site during 2007-2008 winter operations to recontour and reshape the sump caps. Work will be conducted according to the Northwest Territories Water Board *Protocol for the Monitoring of Drilling-Waste Disposal Sumps*.