



## **Metadata Citation Information**

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(week March 2-10, 2007)

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Unedited technical report as provided by lead NRCan  
scientist. It is included here as background program  
documentation only.

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### MALLIK WEEKLY (plus a day) SCIENCE REPORT # 4

<p><b>Week:</b></p> <p><b>Science Supervisors:</b></p>	<p><u>March 2-10, 2007</u></p> <p><u>Scott Dallimore</u></p> <p><u>Yutaka Imasato</u></p> <p><u>Numazawa</u></p>	<p><b>Weekly weather:</b> <u>Cold! (-35 to -40°C + 18 hr storm with near white out conditions)</u></p> <p>Sun rising about 9:00, setting about 19:30 (Fire alarms at 20:00 are in daylight now!</p> <p><b>Camp:</b> ~117 soles</p>
<p><b>28 Scientists on site:</b></p>	<p><u>Drill site:</u> Nixon, Dallimore; Mwenifumbo (NRCan); Nakamizu, Numasawa, Imasato, Takayama, Cho, Ikegami, Suzuki, Matsuzawa, Kurihara, Yamamoto (JOGMEC)</p> <p><u>Inuvik:</u> Taylor (Aurora); Sugiyama, Dreuillault, Hourshuyama (JOGMEC)</p> <p>Calgary: Wright (NRCan) Yasuda, Fuji, Suzuki, Uchida, Oyama, Kawamura, Sato, Funatsu (JOGMEC)</p> <p>Drill site Operations: Mizuta (JOGMEC), Wakatsuki (Japex)</p>	



Photo of the week: Day five of the epic Mallik 2L- IP open hole well logging program

Well site operations activities:

Mallik 2L-38: Avid readers of the Mallik science report will know that all four issues have devoted significant narrative to the epic struggle to advance operational activities. We constantly have been reminded that we are in a remote Arctic setting in the midst of a cold winter. This week's primary R&D activity was the open hole well logging of Mallik 2L. The goal of the open hole logging was to establish the reservoir parameters of gas-hydrate-bearing strata and also the zones between the hydrate layers. Accurate assignment of parameters such as gas hydrate saturation, porosity, and permeability are critical inputs to reservoir simulation studies. With the change in the drilling scenario for Mallik 2L chronicled in last week science report, another critical goal of this program was to evaluate if the borehole condition of our production well was in good condition and suitable for testing.

Four open hole logging runs, code named 'Mallik 2L 1-P', were planned as a centre piece of the Mallik R&D program. The paper program (i.e. designed in the office) was expected to be undertaken in 48 hours. However, as we have encountered frequently over the past weeks the field is a different place than the office. This is especially the case when you are running logging tools that are very advanced and in some cases are over 30m long when bundled together. Run 1 began with a storm warning being issued in Tuktoyaktuk, but probably more problematic was the cold temperatures which again this week were consistently below -35C. One problem was that moving the tools from the heated storage truck to the rig floor typically took 30-60min. With a wind and cold temperatures inside and outside of the drill rig, the tools typically experienced flash freezing. Schlumberger wireline engineers Lanny and Jimmy worked with technicians Mark and Mike to painstakingly steam each connection to ensure that the O-rings were thawed. Assembly that would normally take just over an hour were typically taking 4 hours or more. In addition we had to lower each tool string in the hole to allow them to reach suitable operating temperatures. Scott has met Lanny and Jimmy several times in the gym in Inuvik as he pitifully tried to jog a few kilometres while watching these two athletes lifting weights. It is not clear if weight lifting is part of the rigorous Schlumberger training program however in our case it certainly was beneficial that the entire crew were in top shape.



Nakamizu-san (known at the camp as Maximize-san) works through the night on 1P logging run; Lanny, James and Mark hard at work steaming logging tools on the drill floor during run 5.

The story of the Mallik 1-P logging program is long. Two days of logging, a wiper trip to clean hole and another two days of logging. It included freezing problems, hardware problems, OSU problems and near white out conditions for 18 hrs. Provision of wireline logging services of course is the pride and joy activity for Schlumberger as a company and certainly we had the full resources of back up

equipment (including a new Maxis logging truck) as well as a resourceful and hard working crew. In the end it was five runs not four and a memorable experience overall for Nakamizu, Takayama, Mwenifumbo and Dallimore-sans to witness.

Mallik 3L-38: This well is being readied as a water injection well for next year. Activities this week were mainly to prepare for open hole logging of the lower hole section planned for injection. An attempt was made to log Mallik 3L without success as a tight zone was encountered which prevented the logging tools to pass. Several clean up trips were run to better condition the hole, but priorities were clearly with the 2L activities thus the logging crew were switched to Mallik 2L for main operations.

Camp Life:

Beds at the camp have been at a premium at Mallik and this week we added yet another small annex facility. The 120 persons on site last night now have the luxury facilities of the main camp, the separate annex camp, the isolated sleeper camp and the auxiliary annex camp. As the camp grows in size of course the logistics requirements grow. At the moment we are hauling m3 of water, and treating and processing m3 of sewage and grey water. At breakfast we are eating 150 pancakes a day, 40-50 owlets, 35 pounds of sausage and bacon, 45 egg McMuffins, 3 bottles of ketchup, 20 pounds of porridge and 2 bottles of Tabasco sauce. Scott is drinking 1 litre per day of grapefruit juice and trying to convince all who will listen of the benefits of this fine beverage. So far only Motoi-san is partaking but approximately 50 litres of tang is being consumed. It sounds mundane but the functional reality of a drilling operation is that all of the light, heat, food and water must be delivered seamlessly for operations to succeed.

The camp is a busy place and it is surprising sometimes who will drop in for a cup of coffee. This week Rob Walker, our DIAND Land Use authority, brought a crew of 13 territorial land use inspectors to Mallik for a tour of our facilities. Scott, Mark, Gerardo, Alex and Mike all pitched into give them a science review of the project, and walk through the facilities and the typical environmental issues we faced and have tried to resolve. We set out with the Mallik project to establish it as a show piece for environmental awareness and outreach. Frankly to date we have been so consumed by logistics that we have struggled to achieve this. But we will keep trying and it did feel good in this case to try to meet with this group of inspectors who were having their annual meeting in Inuvik.



Rob Walker (DIAND) and part of his touring group of 13 land use inspectors (only Land use inspectors would be more fascinated by a sewage treatment plant rather than a drilling rig!). Gerry the camp boss (the man in black) with his dapper troupe of cooks and helpers.

Science report:

Circumstances encountered over the past 8 days have dictated serious adjustments to our operational plans. As the reason we are at Mallik is to accomplish R&D goals, as a team we have evaluated many go forward options. With 28 R&D participants in North America we have had considerable consultations to undertake. This week was therefore a week of meetings.



Meetings In the JOGMEC office, at the drill site, in Inuvik, on the phone, on the drill floor and in the bar

Evaluation of Mallik 2L for a main production testing zone: Last weekend the G&G, production and operations teams met to decide if the re-drill of Mallik 2L-38 was sufficient for us to continue with it as the main production well for this year and most likely next year. The basis of our decision was a quick open hole well logging program conducted late last week when an opportunity arose when our MWD tool had to be tripped out of the hole. With the leadership of Dallimore/Kurihara on gas hydrate geological evaluation, Imasato/Ikegami on casing and monitoring, Yamamoto on zone isolation, Numasawa on production we considered all of the issues of pertinence to our R&D goals. Jointly we agreed that things looked very good. On a rating out of 10, the enlarged 2L well bore was rated 9.5 out of 10 for our primary research goals. The only low rating was the evaluation of the hole for casing deployment which was 6.5 out of 10 as there was concern about several zones with variable hole size (some oversized some undersized). We agreed that vigilance and care in hole conditioning, wiper trips etc., would greatly resolve this risk.

Decision to drop Mallik 6L-38: Late in the week as we moved closer to finishing Mallik 2L-38, attention shifted to assessing if it was realistic to continue with the base plan which called for moving the Akita rig to drill the Mallik 6L-38 monitoring well. Unfortunately the operational realities were harsh. As described in this report and in past ones, time curves for Mallik 2L-38 exceeded predictions by 100%. The most harsh reality however is that the break up of the Mackenzie River in May dictates that late April is the very latest field activities can take place in the entire delta area. While with the days remaining in the field season it might be possible to drill 6L, there simply was not time to complete the R&D activities such as logging, coring and the casing run. Concern was also raised that the complex operations called for to advance 6L might conflict with the production testing, which all agreed was the primary goal of the program. The decision to drop 6L was not taken lightly. Consultations with each R&D team were undertaken and late in the week the team leaders reached consensus that it would not be prudent to continue with plans to complete 6L-38 this year. Our recommendation to JOGMEC and NRCan management was that we should keep our eye on the main prize which for this year was production testing. Management accepted this position late in the week and the operations team began to make plans to optimise our next 30 days of operation with the focus on Mallik 2L activities, especially production testing.

Outlook for the remainder of the field program : Frankly, with so many set backs and adjustments to a program it is natural perhaps that there has been the odd moment or two (or three) that R&D team members may have had feelings of loss, concern that a decision will let down your colleagues, worries that we are letting down management and just plain frustration that we have not had a break yet or a spell of good luck. It has been a very hard week for all of us. But a number of us have said more than once, if it was going to be easy someone would have done it already. As Scott sends this Science Report (a day into the new week) the attitude, resilience and camaraderie of the team is quite astounding. Today we had a team meeting to talk about the important step of the casing and monitoring installation on 2L. The professionalism and planning of the IPM and SKK team was quite impressive and frankly a pick me up for our entire field crew. In Calgary on Friday the coring team who could easily have been devastated to lose coring on Mallik 6L began to consider some new research priorities that can be pursued in a thoughtful and efficient way even without core. An impressive well logging team is awaiting arrival of the logging data from Mallik 2L JOGMEC management has also been quite incredible with their steadfast support. We will and we must stay focused on our R&D goals and objectives, we will and we must do better and learn from the field experiences to date, and we will and we must keep our teams together and focussed on our R&D objectives.