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MEMORANDUM

To: Ken MacLeod
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Date: 2 August 2006

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From: Jim Lovekin

Subject: Summary of Recent Temperature/Pressure Surveys at Meager Creek

Introduction

This memo summarizes the results of temperature/pressure surveys run in MC-6, MC-7 and MC-8, including recent surveys in late June and early July 2006. Figure 1 shows the sub-surface trajectories of these wells. Figure 2 shows the most representative temperature surveys for these wells plotted against elevation, in comparison to interpreted stabilized temperatures in the other deep wells at the project. For MC-6, the most representative survey dates from 17 May 2005, prior to a 2-month period of injection into this well in July-September 2005. For MC-7 and MC-8, the most representative surveys are the most recent ones (27 June 2006 and 5 July 2006, respectively). Figures 3 to 5 are downhole summary plots for MC-6, MC-7 and MC-8, showing the sequence of all temperature/pressure surveys run in these wells.

General Observations

As shown in Figure 2, MC-6, MC-7, and MC-8 all achieved significantly higher temperatures at higher elevations than earlier deep wells at Meager Creek. At an elevation of +400 meters with respect to mean sea level (msl), all three wells reach temperatures of approximately 230ºC, which is 75ºC hotter than the next hottest well (MC-1) at this elevation.

Below about +400 meters msl, MC-6, MC-7, and MC-8 all show nearly isothermal or slightly increasing temperature gradients for over 1,000 meters. The temperature of MC-6 increases slightly with depth, reaching a maximum of 260ºC on bottom, at an elevation of about -1,100 meters msl. MC-7 extends somewhat deeper, reaching a maximum of 259ºC at about -1,300 meters msl, and then shows a temperature reversal on bottom. In Figure 2, the temperature reversal at the bottom of MC-7 is extrapolated to approximately 245ºC at an elevation of -1,600 meters msl, based on earlier surveys that extended to greater depths than the most recent survey (see Figure 4). MC-8 shows a nearly isothermal gradient from +400 meters msl to -750 meters msl, then a temperature reversal to 216ºC on bottom at about -800 meters msl. The temperature

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reversal at the bottom of MC-8 is believed to represent unstabilized temperatures still recovering from the effects of the MC-6 injection test in July-September 2005, as discussed further below.

MC-6

The sequence of MC-6 surveys can be summarized in four stages:

- An initial set of surveys that show the well heating up from the cooling effects of drilling (18-21 November 2004)
- A pair of surveys that show the cooling effects of a short injection test during completion operations (21-22 November and 22 November 2004)
- A sequence of surveys showing progressive recovery of the well to stabilized temperatures over several months after completion (6 February 2005 to 17 May 2005)
- A sequence of surveys showing progressive heating up of the well after the injection test of July-September 2005 (19 October 2005 to 23 June 2006)

The last set of surveys show that the well is still heating. The zone with the greatest amount of cooling (presumably reflecting the greatest amount of invasion by injected water into the formation) is at an elevation of about -700 meters msl. As of 23 June 2006, the temperature of this zone was 216.5ºC, compared to temperatures of about 247ºC in May 2005. The temperature reversals in the last set of surveys show evidence of permeability extending from about -300 to -1,100 meters msl (or from a measured depth of 1,800 meters to the bottom of the well at 2,663 meters). As of 23 June 2006, the bottom-hole temperature was 225ºC, compared to 260ºC in May 2005.

MC-7

The sequence of MC-7 surveys is somewhat simpler, as the well was apparently unaffected by the injection testing in MC-6:

- A set of surveys at the time of initial completion show the beginnings of temperature recovery from the cooling effects of drilling (4-7 February 2004). A survey during a short injection test on 5 February 2004 showed cooling only in the upper portion of the hole (above -300 meters msl or a measured depth of 1,800 meters), but the absence of cooling further down the well may simply indicate that the injection water had not had time to reach greater depths when the survey was run. The inflection at about -1,450 meters msl (3,100 meters measured depth) in the survey of 7 February 2005 suggests that water from the brief injection test reached at least to this depth. Permeability at this

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depth is also supported by the presence of a minor amount of lost circulation during drilling.

- A sequence of surveys spanning more than a year, showing progressive recovery of the well to stabilized temperatures (15 March 2005 to 27 June 2006). This is a bit of a simplification, because there was a minor amount of injection into MC-7 in conjunction with the completion testing of MC-8 in late May 2005 that is not reflected in any of the MC-7 surveys.

The temperature in the interval from about -1,100 to -1,300 meters msl essentially matches the temperature of 260ºC measured at the same elevation in MC-6. All three of the last sequence of surveys in MC-7 indicate a minor temperature reversal below about -1,300 meters msl. The most recent survey (27 June 2006) encountered fill at a measured depth of about 3,000 meters, possibly due to sloughing of this unlined wellbore during the injection in May 2005. The estimated temperature of 245ºC at -1,600 meters msl represents an extrapolation from the bottom-hole trends of the last three surveys in MC-7.

MC-8

The sequence of MC-8 surveys shows the effect of injection both in MC-8 itself and in MC-6:

- An initial set of surveys around the time of completion suggests only a minor amount of fluid invasion associated with the major loss zone at about -750 meters msl (2,345 meters measured depth) (28 May to 17 June 2005).

- A sequence of surveys in July 2005 shows the effect of an injection test into MC-8 over the period of 2-4 July. A survey immediately after injection (4 July 2005) showed that the fracture near the bottom of the well had been significantly cooled (to about 82ºC). Surveys on 12 and 27 July 2005 show progressive reheating, such that the fracture zone showed essentially no reversal as of 27 July 2005. The bottom-hole temperature at that time was 215ºC.

- A sequence of surveys from 19 August to 2 September 2005 shows cooling in the bottom-hole fracture interval in MC-8, reflecting breakthrough of injection water from an MC-6 injection test that began on 7 July 2005. As of 19 August 2005, the bottom-hole temperature of MC-8 was about 180ºC. Meanwhile, the portion of the hole above the bottom fractured interval continued to heat gradually.

- Temperature recovery of the bottom fractured interval began with the cessation of MC-6 injection on 9 September 2005. A sequence of surveys from 20-21 September 2005 to 5 July 2006 shows temperatures in the bottom-hole fractured interval rising gradually to 216º, while temperatures in the long isothermal interval above the fracture zone have

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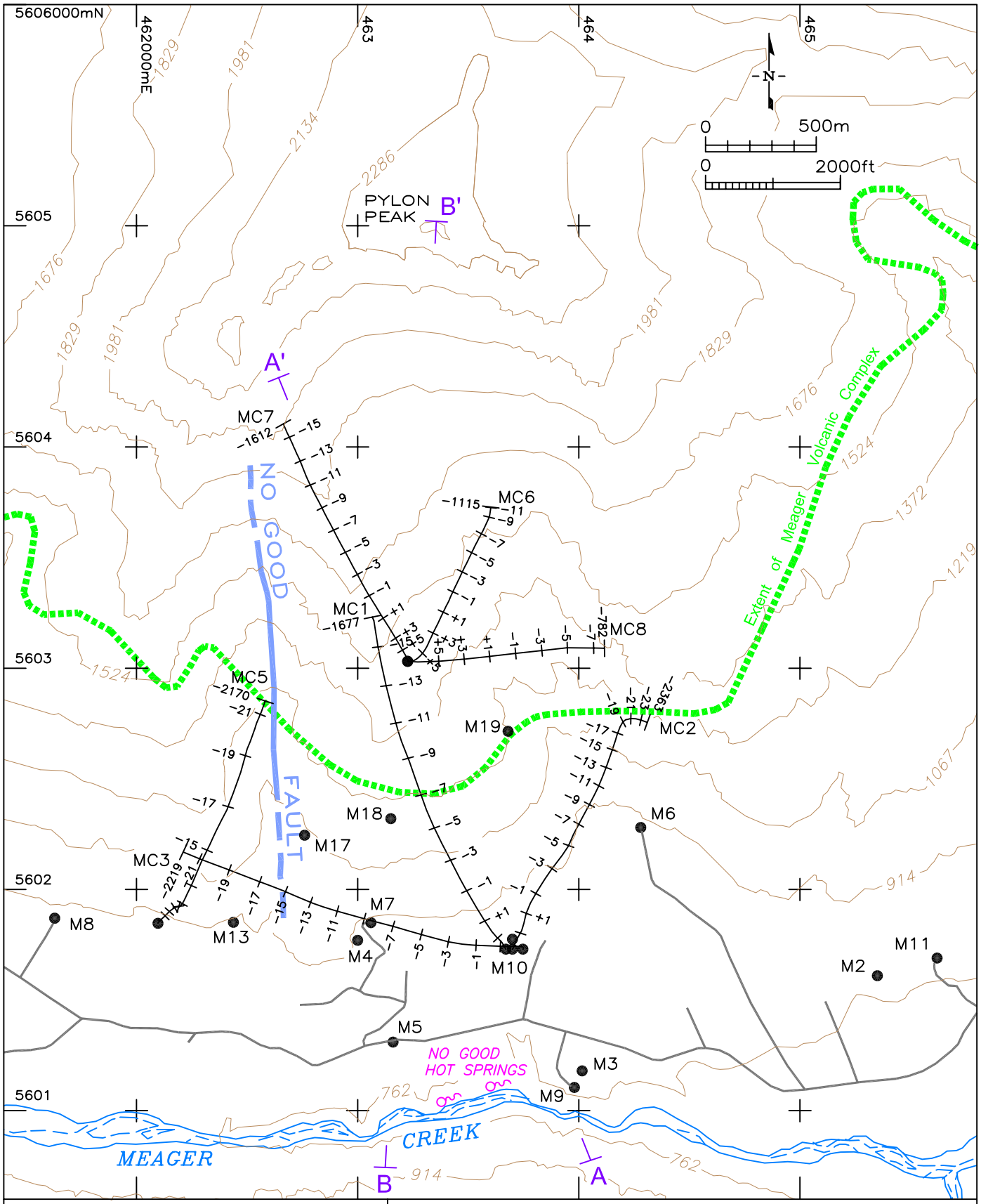
continued rising gradually. The maximum temperature in the well as of 5 July 2006 was 237ºC at about -650 meters msl (2,200 meters measured depth).

The long isothermal interval in MC-8 from +400 to -750 meters msl suggests essentially conductive heating with no evidence of formation permeability. The sequence of cooling and heating in the bottom-hole fracture interval indicates that this zone is affected by fluid circulation and is in communication with adjacent well MC-6.

Implications for Well Testing

Because the wells with the best evidence of permeability (MC-8 and MC-6) are both still recovering in temperature, it would be premature to proceed with testing by air-lifting at the present time. It is expected that MC-6 will eventually recover to stabilized temperatures in the range of 245ºC to 260ºC in the permeable interval below a measured depth of 1,800 meters. The final stabilized temperatures in the bottom-hole fractured interval of MC-8 are uncertain, but it is not unreasonable to expect that these could reach the range of 235ºC to 240ºC. GeothermEx recommends that an additional set of temperature measurements be made in mid-September 2006. This will help determine whether the optimal time for flow testing of MC-8 and/or MC-6 will be later this fall or the following field season.



LEGEND

- Geothermal well
- Deviated well trace
- −15 Elevation, m (in 100ths)
- Bottomhole
- Road
- 914 Elevation contour, m

Figure 1: Well location map, South Meager Project

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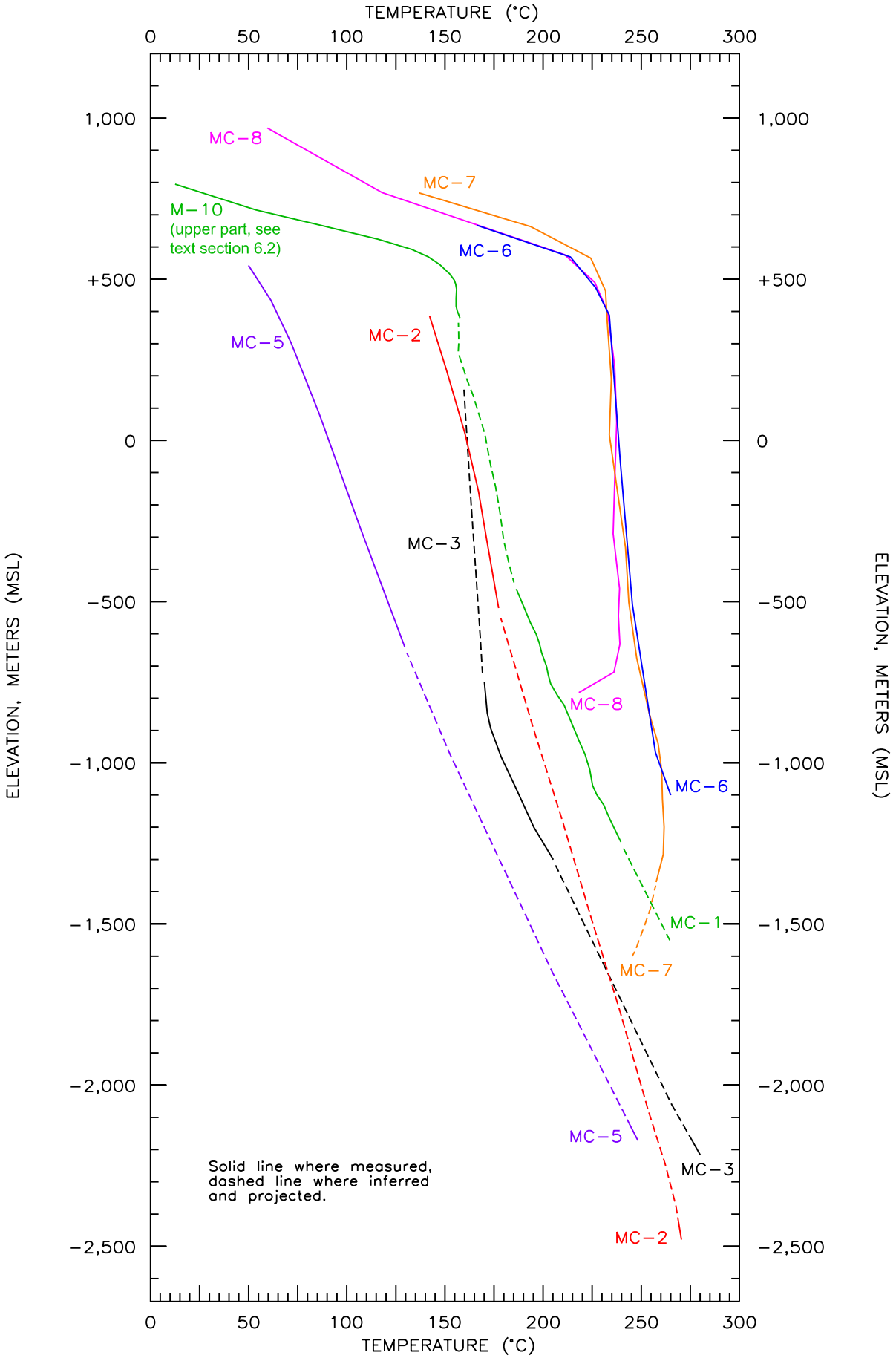

Figure 2: Composite temperature profiles of deep wells at South Meager project

Figure 3: Downhole summary plot, South Meager well MC-6

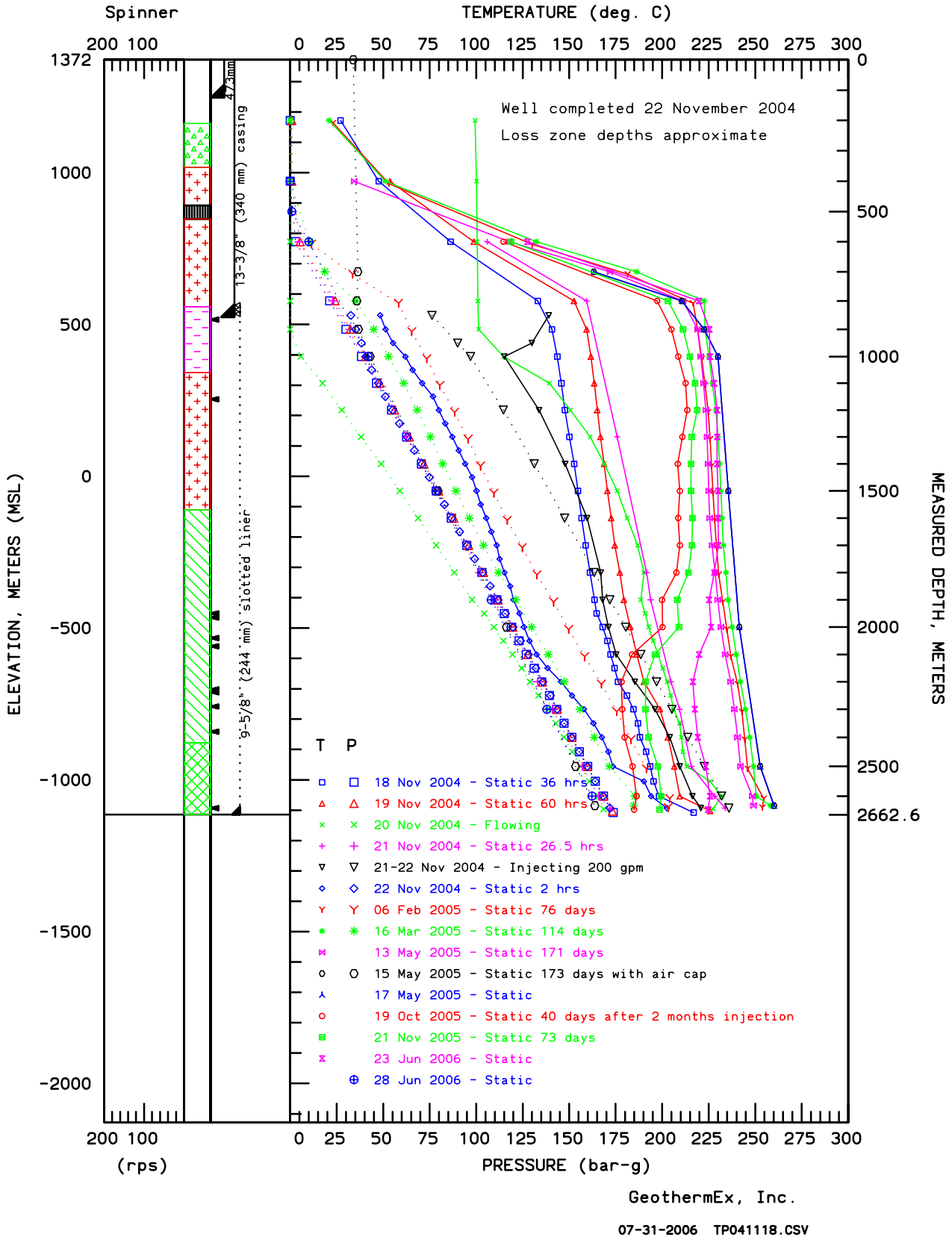

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Figure 4: Downhole summary plot, South Meager well MC-7

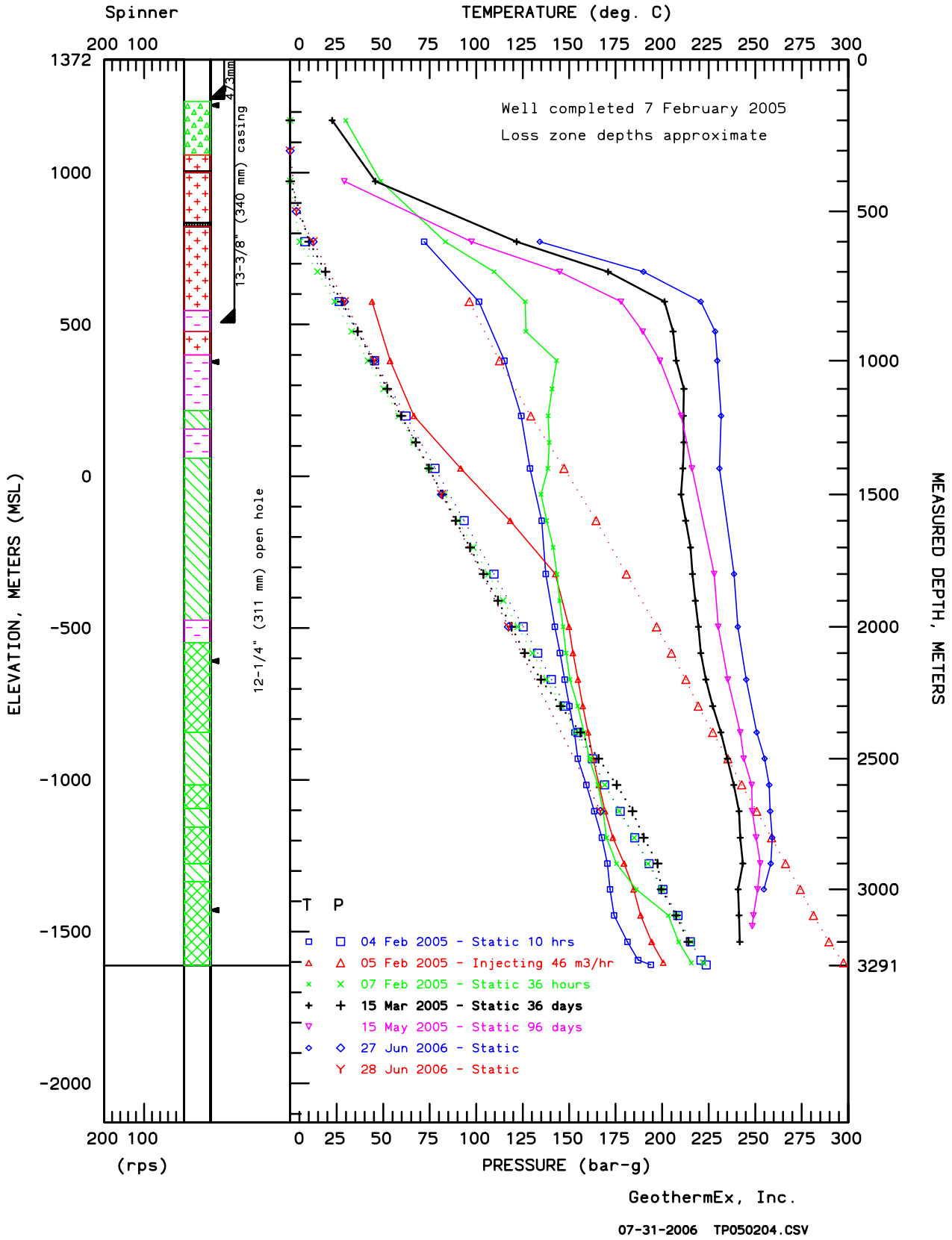
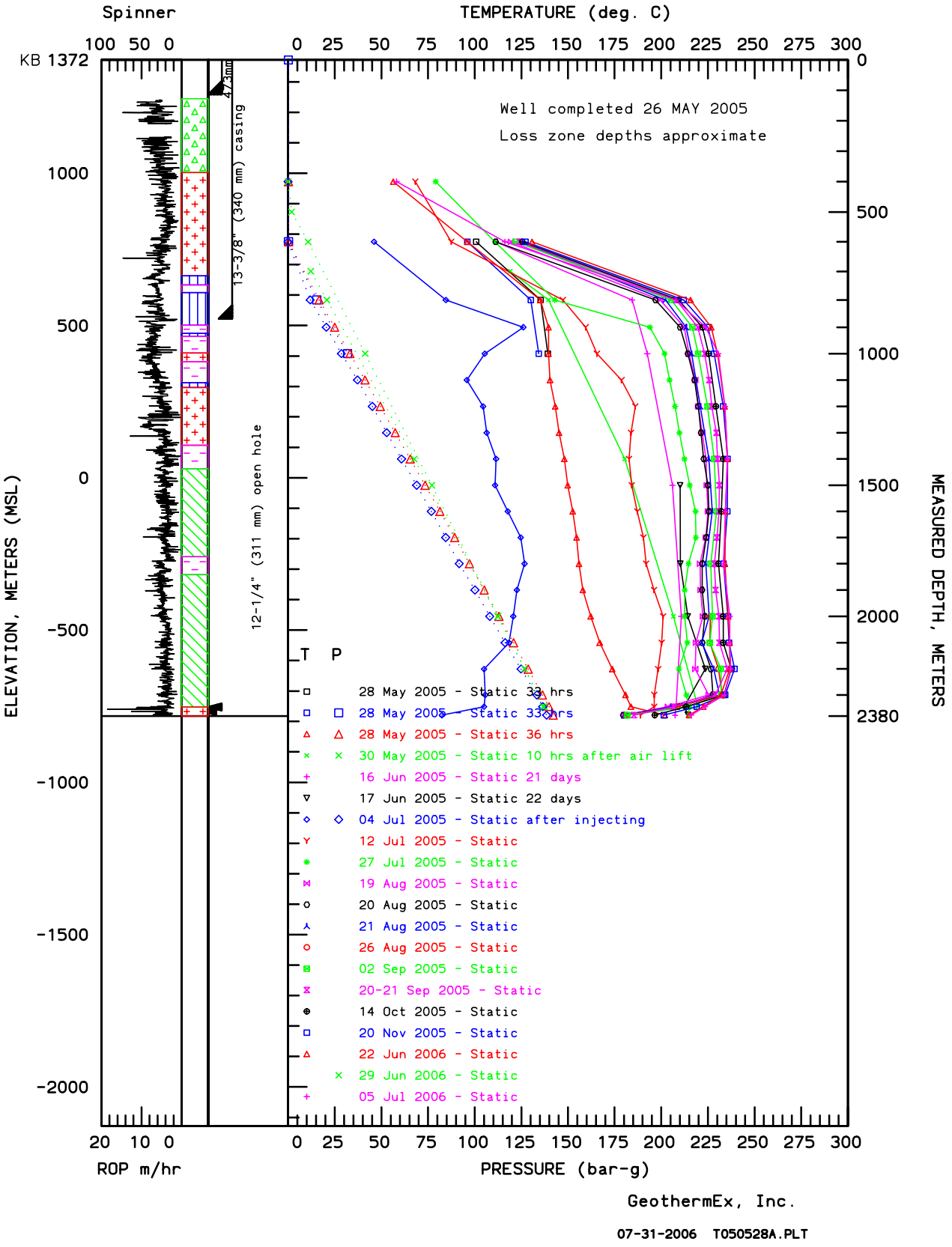
Figure 5: Downhole summary plot, South Meager well MC-8