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MEMORANDUM

To: Ken MacLeod
Western Geopower Corp.

Date: January 18, 2005

From: Roger Henneberger

Subject: Targets for Wells MC-8 and MC-9

At your request we have reviewed the selection of targets for wells MC-8 and MC-9, based on the data that are now available, and on discussions with WGP personnel. As you are aware, only preliminary results are available for MC-6 (from completion logging and testing), and MC-7 is still being drilled. The present evaluation is based in part on the preliminary indications from MC-6, and on the assumption that MC-7 will have similar characteristics to MC-6 when it is completed. A significantly different result from MC-7 could substantially change the recommendations presented below.

According to present plans, both MC-8 and MC-9 are to be drilled from the same pad as MC-6 and MC-7. With regard to optimal targets for production wells, the following points are important to keep in mind:

- Preliminary temperature measurements from MC-6 have tended to confirm the model of subsurface temperatures presented in GeothermEx's resource report. Therefore, there is a considerable area within which temperatures can be anticipated to exceed 200°C within 800 to 1,000 m below the surface, and temperatures in the range of at least 230°C to 250°C are likely to be present at deeper levels. Numerous potential high-temperature targets are available.

- It appears that the major fractures needed to yield highly productive wells have not been encountered by the wells drilled to date. It is common that such fractures are located somewhat randomly, particularly in reservoirs hosted by massive crystalline rocks (as is the case at South Meager). Therefore, the apparent absence of major fractures in MC-6 and (so far) in MC-7 does not mean that the area around these wells is devoid of production potential; a highly productive well might be drilled close to either MC-6 or MC-7.

- There are no methods of surface investigation that can be used to pinpoint the locations of major fractures deep in the reservoir. At this point, the temperature distribution (combined with the indirect evidence from sources such as the MT surveys) remains the best guide to the overall distribution of permeability, and therefore an indicator of the general, if not specific, zones where major fractures may be found.

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The optimum targets for wells MC-8 and MC-9 should, in addition to providing the best probability of encountering commercially productive zones, serve to provide information about an as-yet-undrilled sector or sectors of the geothermal reservoir. The most important zone where potential targets meet these criteria is an arcuate corridor extending, in approximate terms, from the zone between MC-6/MC-7 well pad and the position of corehole M18, eastward through the location of corehole M19 and then northeastward, being bounded on the northwest by the trace of well MC-6 (Figure 1). Although wells MC-1 and, to a lesser degree, MC-2 passed laterally through this zone, they did so at elevations below –500 m (msl), thereby passing under potential zones of interest. Coreholes M18 and M19 confirmed high temperatures (of at least 210-220°C at shallower depths) in this zone, but did not reach the deeper level of interest where still higher temperatures (240°C or greater) are likely to be present. M18 and, in particular, M19, also had direct and indirect indications of permeable zones within the range of depths that they penetrated.

Based on these considerations, the targets for MC-8 and MC-9 that offer the greatest value are located in the corridor south and east of the up-hill (MC-6/MC-7) well pad. To adequately investigate conditions in this sector and ensure an optimal chance of commercial productivity, one target should be in the vicinity of or to the northeast of M-19 (southeast to east of the up-hill pad). This is the preferred first target (i.e., for well MC-8). The second target, on a preliminary basis, should be further west within the corridor, roughly in the sector between M18 and M19. However, the selection of a second target may be strongly influenced by the results obtained from MC-8.

The two targets can be described in general terms as follows. Some refinement of the targets is likely to take place as additional data (particularly stabilized temperature measurements) are obtained from MC-6 and MC-7. However, these refinements would mainly affect the details of directional programs, and not the basic well designs.

- **MC-8**: Targeted toward M19 or to the northeast of M19, reaching sea level about 200 m short of M-19 and an elevation of –400 m at a horizontal throw of about 600 m. This can be achieved by deviating to the well along a course that is roughly 55° to 90° east of south, kicking off near 400 m depth and building to a drift angle of 25°-26° (similar to MC-6). Temperatures may decrease beginning somewhere below –400 m elevation along the well's course; therefore, the total drilled depth should be between 2,000 and 2,500 m.

- **MC-9**: Depending on the final selection, the target might be reached either by a vertical well from the up-hill pad, or a moderately deviated well directed roughly southward, with a maximum deviation program no greater than that described above for MC-8. As noted above, the program for MC-9 should be reviewed, and modified as necessary, based on the results of MC-8 (as well as any pertinent results from MC-6 and MC-7). Again, a total depth in the range of 2,000 to 2,500 m is likely to be appropriate.

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The basic well design used for MC-6 and MC-7 is suitable for the depth range and directional program of these targets. Therefore, no significant change in well design (or in materials and equipment needed for the wells) will be required.

Best regards.

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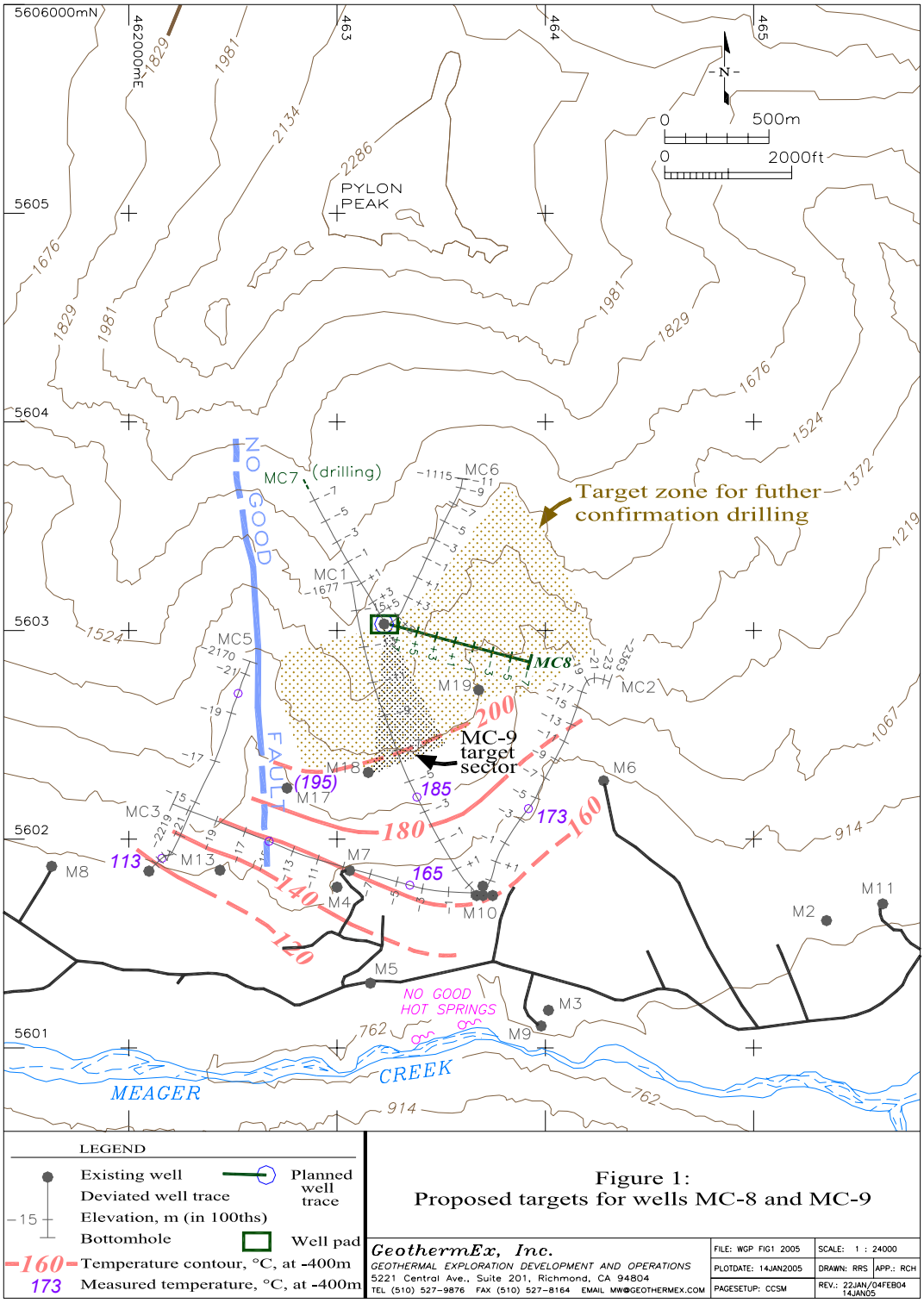

Figure 1:
Proposed targets for wells MC-8 and MC-9